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CAPTAIN NAPIER'S TRAVELS IN NORTHERN PERSIA.

CAPTAIN the Hon. G. C. Napier, who has recently returned to India after an adventurous tour in Northern Persia, has submitted to the Government of India a very full diary, kept by him during his travels, accompanied by a collection of routes and itineraries, most of which will prove of great service in the compilation of a fresh map of this important region. We are enabled to lay before our readers an abstract of the narrative, which is of a very interesting character.

Captain Napier left Gulahek, the summer quarters of the British Legation at Tehran, on the 3rd of July 1874, and thence journeyed eastward in the direction of Shahrud, along the ordinary road for caravans and troops. He expresses himself as much struck with the fertility of the land about Aineh-Vezan, heavy crops of cereals, maize, pulses, castor oil, and cotton being here raised. With assistance in digging wells and water-courses, and a good road across the mountains to Mazanderan, a large population might here be supported in plenitude. The road lay through Firozkoh, a village situated at the entrance of a rocky gorge, shut in by two opposing cliffs of limestone, between 300 and 400 feet high, and crowned with the ruins of an ancient fortress ascribed to Alexander the Great. Through Gursafid and Rudbar, Captain Napier proceeded to the sacred spring of Astani, which is chiefly remarkable for the great volume of water which issues from one point, and the complete sterility of the valley and the surrounding mountains from which it is fed. It is at the junction of one of the main routes from Mazanderan and Astrabad to Shahrud and Damghan, and is thus much frequented by pilgrims. Captain Napier then struck northward by the Tung-i-Shamsherbur Pass, a narrow passage about 150 feet long, and 18 feet wide, between two perpendicular walls of smooth limestone, a pass which he identifies with the ancient Caspiæ Pylæ, and thence through the Tang-i-Loodian defile to Shakoh. Here there are seams of good coal, which might be worked from the surface, but the people appear to be ignorant of its use. At Tash, however, a few miles off, there was a mine which had been worked for some time, the coal being carried to Gez to supply the Russian steamers. The working of the mine had ceased with the demand, the steamers being supplied from some nearer source, or by the substitution of "Baku oil" (naphtha ?). Before approaching Shahrud many large villages are passed, all surrounded with walls and watch towers, but the necessity for these defences has passed, for it is more than eleven years since a Turcoman has been seen on the plain except as a peaceful trader. At Shahrud the Russians have a large connection, and a good trade in cotton bales, raw silk, hardware, and candles is done by means of Armenian agents, who are under their protection. From Shahrud the captain's progress to Badasht, by way of Armyan, Miandasht, and Abbasabad to Mazinan calls for no remark. From the last-named place the caravan road keeps on due east to Sabzevar and Nishapur, but Captain Napier struck to the north-west and followed a new route leading through the mountains to Jagatai, the chief village of the Jouven State, and thence to the turquoise mines at Madan and Nishapur. Ferumud (17½ miles from Mazinan) is the first village, where there are the ruins of a very handsome mosque, dating presumably from the Arab invasion. Between Ferumud and Jagatai the great spur of Alburz, which runs south of Jah Jarm into the Nishapur plain, is crossed. The road runs for some miles across a level, uncultivated plain, thence it enters a narrow glen, and at ten miles reaches the crest of the ridge, and the pass into the wide valley of Jouven, beyond which, separated by a low ridge, lies the parallel valley of Isferayin, bounded by the Aladagh and Shah Jehan mountains. Both valleys drain westward. At the 30th mile from Ferumud, the road turns down a wide ravine running from the Kabizar about north-east, in the gorge of which lies the town of Jagatai, enclosed by a double wall and substantial flanking towers. From Jagatai to Kamaistan (18 miles) the road runs with a general direction of E.N.E.; the first 20 miles of the route from thence to Rabat-i-Gez (46 miles) is through the most fertile part of the Jouven Valley. Three miles from Rabat-i-Gez itself the valley contracts to a width of 8 or 10 miles, and a few miles further is divided by a low isolated hill into two undulating plateaus. Madan Bala, the next stage, is 25¼ miles farther on; it is noted on account of its turquoise mines, the trade of which is almost entirely in the hands of a few local agents, who purchase the stones at the mines and send them to Mash-had, whence the best are exported almost exclusively to Russia. Although rival mines have been started elsewhere, the Government still derives an increasing revenue from Madan. About 2 miles on the road to Nishapur (28 miles) is a salt mine owned and worked by the villagers. From Nishapur Captain Napier journeyed to Mash-had, where he rested a few days, and thence made for Kelat, crossing the main

chain of this branch of Elburg Mountains, a range of hard gray limestones rising in sharp jagged teeth to a height of 6000 or 7000 feet. The track from Verdeh to Kelat he describes as picturesque beyond description. On one side steep slopes of purple, green, and brilliantly red clay and marl, with high projecting buttresses of sandstone, scantily clothed with fine specimens of juniper; on the other, peaks and crags of slate and limestones, the strata inclined, and sending out into the glen steep spurs, presenting often an unbroken sheet of rock for 1000 feet, with a sharp edge and distinct serrated outline. In places there is scarcely room for more than one horse to pass, and the track is carried from boulder to boulder in the bed of the stream, across very frail and shaky-looking temporary bridges. In the centre and narrowest part of a narrow defile a new gateway was being built, an imitation apparently of Nadir's gates, which have been swept away by successive floods, but which had been erected by him in order to close up the gaps in the rocky barrier of Kelat, and so create a safe retreat and stronghold for his descendants on his death.

After staying a few days at Kelat, Captain Napier returned to Mash-had, and leaving it by the north-west gate proceeded to Kazimabad. He had opportunity *en route* of observing the system of irrigation here practised (as well as in other parts of Persia), which consists in sinking wells at an average radius of 2½ miles from the central point, and thence conveying the water through underground tunnels to the place to be irrigated, which thus becomes a perfect oasis. Where the soil is light and porous, the tunnel is often supported by short lengths of earthen pipe, but, as may be imagined, slips of earth are not unfrequent, and the cost of maintaining the *kanats* or canals is great. An inspection of the ruins of Toos, which lie about 4 miles north of Kazimabad, led Captain Napier to conclude that it was not earlier than the time of the Muhammadans, and that the town was built "to order" and not a gradual accretion of dwellings. Gunabad, Chinaran, Rodkan, Jaffirabad, and Koochan were successively passed, the latter a square-walled town of about a mile a side, and much dilapidated, owing to a severe earthquake which took place two years before. The Koochan boundary in the Turkman direction is well guarded, there being posts of 200 or 300 horsemen on the border.

From Koochan, Captain Napier marched by an apparently new route to Taveel (24 miles) on the road to Deregez, passing several flourishing Kurd villages, inhabited by a race of men of a very different character from the majority of Persians, their features being handsome and regular, the eyes full and prominent, and beards ample. A glance at these well-fed, well-clothed ruddy men, their terraced vineyards, well-stocked orchards, and stretches of land dotted with ploughs or waving with grain, taken in conjunction with the fact that they are secured by a range of mountains impassable for many miles, for Turkman raiders, led Captain Napier to consider them as the most prosperous Persians he had yet seen. From Taveel to Chapooshloo is 21 miles, but the travelling is very rough, and the descent rapid into a valley fertile but uninhabited, owing to its liability to be devastated by plundering tribes. From the Kibkan stream there is a long stiff climb to the summit of the spur, and the pass of Allahu Akbar, from the east of which a fine view is gained of the plain of Deregez, 3000 feet below. Tall watch-towers, in good repair, guard every path. From Chapooshloo to Muhammad Bagh (*sic*) is 8 miles, through vineyards, gardens, and over a well-cultivated plain. Captain Napier had an escort of 40 horsemen, under the command of the Khan's brother, provided for him, the Khan himself being absent at Mash-had. This ruler has about 800 horse in his pay, and 2000 badly-armed footmen might be raised on an emergency, but neither he nor the villagers have any means of obtaining remounts except through the Turkmans. Muhammad Bagh is defended by a strong outer wall on a good rampart with a wide and deep ditch, and an inner line of wall with towers. The border villages in the Attock, outside the hills, are always liable to attack from the Turkmans. They are consequently defended by good walls with towers and ditches, and guards of armed villagers are kept at the gates and on the walls. The villagers go to their work with matchlock and sword, waiting till the sun is well up, and taking care to get in before sunset. Though the Turkmans have been less active lately, Captain Napier was nevertheless informed that there is not a house in the twenty Attock villages that had not lost some member killed or carried off into a hopeless slavery, the usual ransom being from 10*l.* to 12*l.* 10*s.*, a sum far beyond the reach of an ordinary villager. For the first few miles from the foot of the hills the soil of the Attock is poor and sandy, and in some parts covered with saline efflorescence, while further out, a fertile belt from 4 to 20 miles wide abuts on the sandy wastes which reach to the Aral and to the Caspian. Cultivation in the valley and in the Attock is capable of almost unlimited increase and on irrigable lands in the latter, and on unirrigated lands in both. A very small quantity of silk is raised, and some cotton, tobacco and opium, the latter for home consumption. A few years ago its use was unknown; now it is largely consumed by all classes, but more especially by the khans and their suites.

Nowkhandan, famous for its wine (8 miles further on), was the next stage, and after that Duringar (24 miles), a collection of four hamlets on the banks of the Deregez or Duringar stream. A few miles beyond is the Dawund Pass, an easy one, by which the plateau of Koochan is reached. Isfirji, a large village lying buried in a rocky glen on the south face of the main range, is surrounded with terraced vineyards and orchards, and groves of plane and poplar. The finest fruit in Khorasan is said to be grown here, and finds its way to the markets of Mashhad and Subzevar, the apples, pears, and grapes being equal probably to the best in Europe. The earthquake that visited Koochan laid most of the houses of Isfirji in ruins, and appears to have travelled from north-west to south-east. At Sherwan Captain Napier was hospitably received by the Khan's *locum tenens*. The place is inhabited by about 1000 Turk families, the greater part of whom gain their living by agriculture; some carpets are made, and a good deal of coarse silk stuff for home consumption. Two or three hundred of the townsmen are armed with the *Shamkhal*, a long heavy rifle, or the *Khirli*, a lighter piece, and receive 2*l.* 8*s.* and two kharwars of grain per annum. Koochan is by far the most important of the border states; it is said to number altogether 200,000 inhabitants; and a proof of the slight degree in which they were affected

by the recent famine is to be seen in the number of children, in other parts of Khorasan it being rare to see a child of more than two or three years of age. Two and a half miles from Sherwan is a fine spring called Kara Kazan, considered by the people to be the source of the Attrek, though there is a higher permanent source about 15 miles to the north-east. From Sherwan to Chamaran is 22 miles, and thence Captain Napier travelled to Bujnurd, where he was visited by the Eelkhani and several of his principal officers. That official assured him that the road along the Attrek from Bujnurd to Asterabad, as well as the Gurgan route, was impracticable on account of the unfriendliness of the Yomud Turkmans, and so Napier crossed the Bujnurd Plain to the south of the Aladagh Mountain, which, stretching away to the west, forms a water-parting between the basins of the Attrek and Gurgan for about 50 miles. The valley of Shougan here for many miles is destitute of habitations, the fertile meadow lands, the produce of which would suffice to serve a whole district from famine, forming (as is the case with most of the fairest valleys of Khorasan) the neutral ground between plundering Turkmans and Kurds. The population of Chardeh or Sangkhas, 18½ miles beyond, is decreasing in a manner which it is very difficult to explain. Corn is raised for home consumption alone, land being extensively reserved for cotton, which finds a ready sale to Russian agents in Shahrud. An ascent of the Koh-i-Buhar, a few miles west of the route, affords a fair view of all the principal passes used by the Turkmans as far as Nardin, distant about 20 miles. From Sangkhas to Jah Jarm (20 miles) the route is dotted with small cairns, marking the place where some victim to Turkmans raids has fallen. Jah Jarm is now a small straggling town of 400 houses, but in the time of Nadir Shah there were 5000 families resident there, the decline being entirely attributed to the devastations of the Turkmans, who destroyed all the irrigation works.

From Jah Jarm, Napier marched to Nardur (32 miles). The khan of this place had no horses to organize a proper reception, for his 200 horsemen had been summoned for inspection to Teheran, and being short of horses had emptied all his stables. From this place Napier's route lay down the valley of Nowdeh to Kanchi (16 miles), a district inhabited by a tall, robust and healthy-looking Turkish race. The glens and ravines are clothed with juniper to a height of 2000 to 3000 feet, above which is a dense forest of scrub elm, oak, and maple. The valley is for the most part closely cultivated, the fields being carefully terraced for irrigation, and fenced. From Kanchi a good path winds through the valley to Nowdeh, where the valley extends and opens into the Gurgan Plain. Nowdeh grows rice and wheat, and a little cotton. The people have a tradition that at some remote period the Caspian covered the plain running into the valley and forming a small bay, along the shores of which was a forest of date palms; the villages on either side of the bay used to communicate by boats, and had an extensive trade across the sea. In those times they paid a revenue of 4800*l.*, the produce of the sale of dates. The mountains were bare of forest, the present dense growth of deciduous trees having spread gradually from the west. In the whole range of the Alburz from Teheran to the Herat River, there is no point at which the chain could be so readily crossed by either road or railway as on the line of the Nowdeh Valley, while good coal has already been found in the mountains to the west. Ramayan (12 miles) and Katool (22 miles) were the next stages, and thence the road to Asterabad (25 miles) lay through a magnificent park-like plain, extending from the foot of the hills to the Gurgan River. Rice and wheat is here cultivated, and cotton of a very fine quality for the Russian market. At Astrabad Captain Napier obtained some information regarding the trade in these parts, and learnt *inter alia* that English goods exported from Astrabad sell profitably at Khiva, no heavy import duties having as yet been put on our manufactures.

Journeying to Kurd Mohalla, 16 miles from Astrabad, Captain Napier had opportunity of observing the old highway of Shah Abbas, which must have been laid down with great care, being paved throughout with large pebbles from the numerous mountain streams, and drained by deep ditches fenced with good hedges. A small amount of money and pains would make a good passable track. Mulla Killa, a small port 2 miles from Kurd Mohalla, is frequented by Turkmans, who bring cargoes of salt and naphtha from Chelaken for the Astrabad market. The island of Ashurada is occupied by detachments of two regiments of Russian infantry, and is the residence of the commodore of the East Caspian squadron and other officials. Three or four small vessels of war and a few steam-launches are stationed in the bay to watch the Turkmans and collect the duty levied on their boats. These trade between their own ports and the village ports of Astrabad and Mazanderan, and the island of Cheleken, whence they bring cargoes of naphtha and salt. Every boat is strictly required to show the Russians a pass, and this enforcement has put an entire stop to the coast piracy of the Turkmans, which formerly was so rife. About 4 miles from Gez, a high green rampart of earth runs from the mountains through the forest and over the marshy plain to the shore. Its history is obscure, but the sea-face of the rampart being between 300 and 400 yards from the water's edge, affords a clear proof of the recession of the Caspian. Ashraf, which Captain Napier visited, is in a far better state than in the days of Fraser and Burnes. It now contains forty or fifty shops; three or four of the leading merchants have transactions with Constantinople and Astrakan, exporting cotton, sugar, European goods, cutlery, and hardware, and importing chiefly iron, iron vessels, crockery, &c. The famous garden of Shah Abbas is now entirely neglected, the buildings, fountains, and raised stone terraces being all in ruins. Its natural beauties are perhaps unrivalled. It is backed by lofty wooded heights, and to the north lies the blue bay of Ashurade. Several springs flow through it; the cypress trees are of gigantic growth, and several of them are covered with massive wreaths of wild vine. Orange and citron trees grow in wild luxuriance, their fruit being left to fall and literally covering the ground. Though now of little note, Ashraf should some day be the centre of one of the most important agricultural districts of Persia.

Captain Napier gives an interesting description of Sari, the principal town of the province and seat of Government, but its length will not permit us to reproduce it. Suffice it to say it is flourishing; cotton and wheat being exported, silks stuffs woven, and a good deal also done in leather work, while a good display of

articles from Western Europe proves that the Russians have a good hold on the market, but not a monopoly. Were the roads across the mountains better, English goods from Ispahan would command a large share of the market; their reputation is great, but their price comparatively too high. From Ashraf Captain Napier returned to Teheran by way of Barfarosh, the commercial capital of Mazanderan. This town has not regained the losses in population suffered during the plague of 1832, but is still a large town with an increasing trade. Its port Mash-had-i-ser, 8 miles distant, is said to be frequented by numbers of Russian ships and native craft, and a mail steamer calls once a week and takes up passengers and light cargo for Baku and Astrakan. The remainder of Captain Napier's journey calls for no special remark, though he adds a valuable appendix, consisting of notes on the topography of the Eastern Alburz tract, which will prove extremely serviceable in the construction of future maps. We must not omit to mention that the information derived from Captain Napier's journals indicates necessary modifications in Colonel Baker's map of Northern Persia.

RECENT RUSSIAN EXPLORATIONS IN WESTERN MONGOLIA.

I. SOSNOVSKI AND MIROSHNICHENKO ON THE UPPER IRTYSH, 1872-1873.

IN his Presidential Address to the Royal Geographical Society delivered last year, Sir Bartle Frere alluded to the important Russian explorations going on in Western Mongolia. These explorations have not been alluded to since that time in any periodical published outside the Russian frontiers, and we believe therefore that an account of them may interest the readers of the *Geographical Magazine*.

That portion of the Black Irtysh, which lies outside the Russian frontier was first explored, in 1872, by Captain I. A. Sosnovski (the same officer who has just been despatched to trace the great caravan route which leads from Hankou in China through Mienhien and Hami to Kulja). He was succeeded in 1873 by Captain Miroshnichenko, already favourably known to geographers on account of the numerous astronomical positions determined by him since 1869. The reports of these officers have been published in the *Istvyestya* of the Russian Geographical Society.*

The Black Irtysh is by no means the rapid, broad, and deep river which former accounts made it appear. The inhabitants frequently ford it with their cattle, and even swim their sheep across it, which they would not venture to do if the river were at all rapid. Miroshnichenko found that the valley of the Irtysh slopes gently upwards from the Russian boundary at Ak Tube (1700 feet) to a spot 13 miles above Lake Ulungur (2300 feet). The current of the river between these two points varies between 84 feet and 289 feet per minute; it is slowest above the Ulungur, and swiftest immediately below the mouth of the Kaba. The river 13 miles above Lake Ulungur is only 75 feet wide; near the mouth of the Kran, 21 miles lower down, its width is 315 feet; thence to the Burchum, a distance of 20 miles, it varies between 210 and 357; near the Kaba mouth it is 539 feet wide, and above the Koljir, close to the frontier, 686 feet.*

The depth throughout this extent, from the ferry 13 miles above the Ulungur down to the frontier, a distance of 111 miles, varies between 8 and 11 feet. There are numerous sand-banks and islands, the material for which has been derived from the sand-hills which bound the river for a considerable distance, and the navigable channel is frequently very narrow. Below the Kran it is only 21 feet wide, and even below the Kaba, where the Irtysh has already attained considerable proportions, it does not exceed 56 feet in width. Navigation is likewise interfered with by numerous fords. The lowest of these, $2\frac{2}{3}$ miles above the Koljir, only becomes practicable towards the close of September, and even then its depth is 5 to $5\frac{1}{2}$ feet, but many fords higher up are practicable soon after the spring floods, or at all events by the end of June. Of such fords there are three between Kaba and Burchum, four between Burchum and Kran, and numerous others in the upper course of the river. Near the mouth of the Burchum a ledge of rocks runs right across and forms a cataract, which puts a stop to navigation. Above these falls the river is navigable only in flat-bottomed barges.

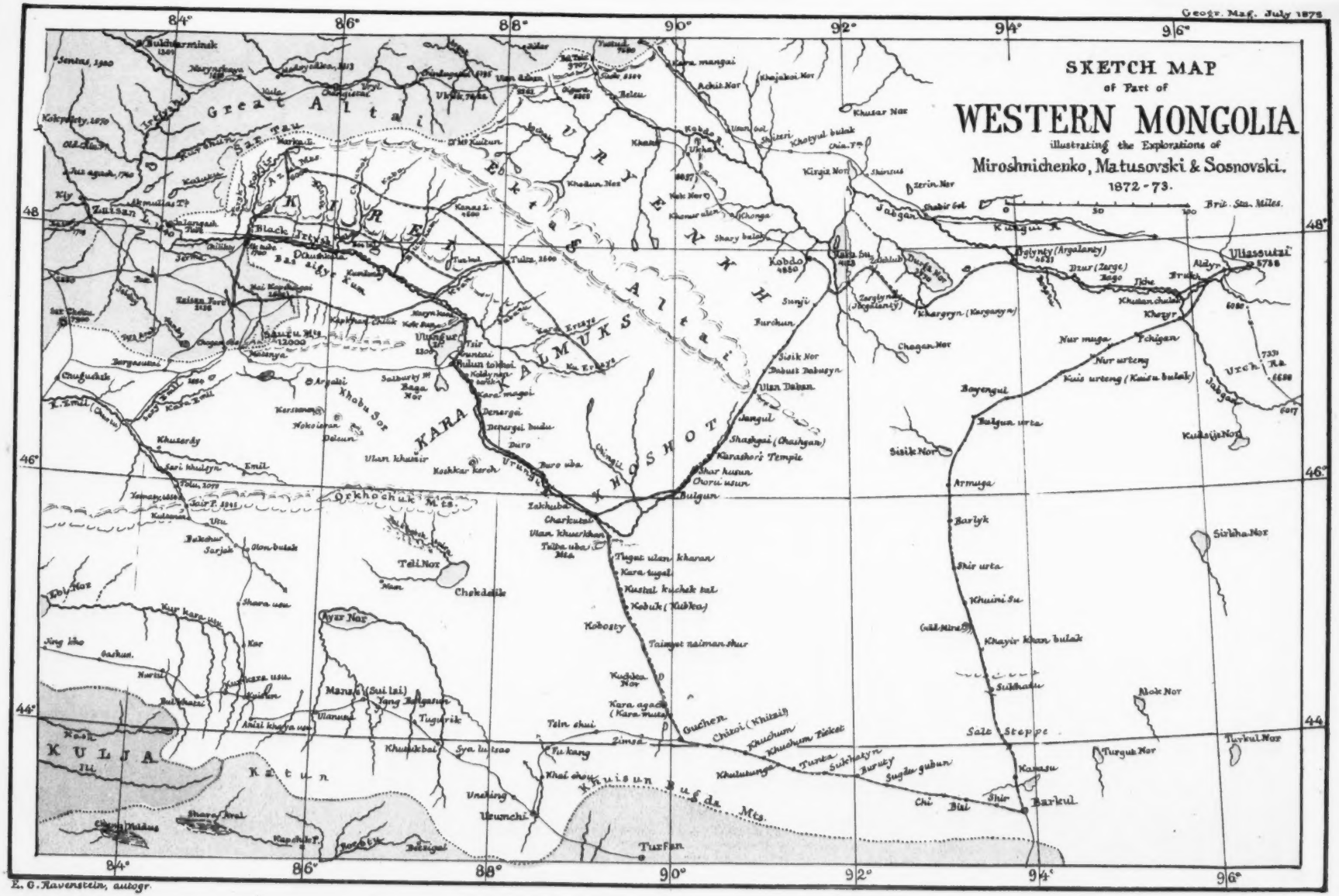
Fertile tracts, covered with luxuriant grasses and dense woods of poplars, aspen, willows, and birch, are met with on both banks of the river, and particularly along the right one. The birch-woods in the Burchum Valley particularly attracted attention, and intending colonists would find there a plentiful supply of water, luxuriant pastures, excellent timber, and a favourable climate. This valley, as well as the main valley of the Irtysh as far as the Kran, is at present occupied by the Kireyi, a tribe of Muhammadan Kirgiz, about 7000 kibitkas strong. The members of this tribe hardly acknowledge the authority of the Chinese officials, and only pay taxes on compulsion. The Russians, on the other hand, are held in high respect, and the small remnant of authority still enjoyed by the Chinese is entirely due to the good offices of the former.

The Upper Irtysh, as well as the lower half of the Urungu Valley, are occupied by nomadic Kara Kalmuks, who are divided into ten tribes, each headed by a "Dzyanga" or "moshka." An "Ukherdai," who acknowledges the Chinese "amban," or governor, residing at Tulta, is the superior chief of all these tribes, and two "Ilgedais," each of whom governs five tribes, are his immediate subordinates. These Kalmuks number about 25,000 souls. They are very poor, and at enmity with their neighbours, the Kireyi, with whom they have almost daily encounters, frequently attended by bloodshed.

The Naryn-kara, a narrow ridge of hills, scarcely 2 miles across, separates the northern extremity of the Ulungur Lake from the Irtysh River. The district bordering upon this lake on the east is known as the "height" of Tsir Guntai, and consists of a plain covered with pebbles and shells, which has evidently been submerged at no very remote period. There are numerous salt lakes and salt pans scattered over

* *Istvyestya* X., part 1, p. 289, part 2, p. 26.

* The above figures are taken from Miroshnichenko's report, and differ to some extent from Sosnovski's measurements. According to the latter the width of the river is as follows:—At the Kran 105 feet; at an upper Ak Tube 210 feet; at the Kaba, where it overflows its banks, 700 feet; near the frontier 420 feet.


SKETCH MAP
of Part of
WESTERN MONGOLIA
illustrating the Explorations of
Miroshnichenko, Matusovski & Sosnovski.
1872-73.
Brit. Sta. Miles.
Great Altai
Extra Altai
KARA ALMUKS
KHOSHOT
Orkhochuk Mts.
Kobdo
Ulassutai
Khargyn. (Kargany n)
Khayir khan bulak
Barkul
Turfan
Kuruin Bugda Mts.
KULJA
Tsaidam Mts.
Sale Steppe
Tarkul Nor
Turguk Nor
Sirkha Nor
Aksu
Uchi R.
Bayangul
Sisik Nor
Tsagan Nor
Kara mangai
Khajakai Nor
Khusar Nor
Kirgiz Nor
Khara nor
Khadun Nor
Khara nor
Khara gol
Khara ulan
Khonga
Sharay baleg
Furchun
Dabust Dabuzyn
Ulan Daban
Jangul
Shashgai (Chashgan)
Karashori Tempic
Shar kusun
Chora usun
Bulgun
Zakchuba
Charkutai
Ulan khuurikan
Telbe uba Mts.
Tegat ulan kharan
Kara tugal
Kustai kuchek tal
Kobuk (Kubka)
Kobosty
Taimyet naiman shur
Kuchka Nor
Kara agach (Kara muren)
Guchen
Chitrai (Khitrai)
Khuchum
Khuchum Pikket
Khuluturuga
Turuta
Sukhaty n
Buruky
Sugdu gubun
Kamasu
Chi
Biu
Shir
Tsagan Tologai
Tsagan Tsaidam
Tsagan Nor
Tsagan Khoshun
Tsagan Khoshun
Tsagan Khoshun

it, and the latter furnishes an almost inexhaustible supply of the very finest rock-salt, which is exported by the Kirgiz of the neighbourhood. The immediate vicinity of the lake is altogether without vegetation, but beds of graphite have been discovered in the Naryn-kara, and deposits of pure saltpetre in the Koksun, the western prolongation of that ridge.

The Urungu (Burlu-togoi or Burul-tokhoi) is the only tributary of this lake. It flows in a deep and narrow channel, and can easily be forded, even near its mouth, except towards the close of March and the beginning of April, when the spring floods take place. The average width of this river is 105 feet; its current is slow, and its waters are discoloured by large masses of sand and loam held in suspension. Wild-olive woods extend along both banks, and the wood of the trees is used for making axles for wheels, articles of furniture, and household utensils.

The town of Bulun-tokhoi (Burul-togoi) lies at a distance of 10 miles from the mouth of the river. It is a place of resort for all sorts of bad characters. Its inhabitants first became known to the Russians through an attack upon the fortified post Zaisan, which they made in 1869. The Kireyi then applied the the term of Kyzyl-ayak—"red boots"—to them, with reference to the red Chinese boots they wore. Bulun-tokhoi is a dirty place, and consists of two quarters, about one-third of a mile apart, and each governed by its own Yuan, assisted by three popular representatives, and subject to the Chinese governor of Tulta. One of these quarters has about 160 houses, inhabited by 900 Sibé, Solon, and Chinese, collectively known as Kara Kitaizi or Black Chinese. The Mongol quarter numbers 150 houses, with 800 inhabitants, principally Oeloet, Chakhar, Kalmuks, &c. The position of the town is exceedingly favourable for commercial purposes, and roads lead from it into Mongolia, Dzungaria, and the Russian territory, but hitherto only retail business has been carried on here, principally by Russian Tartars.

Geographers feel particularly interested in a supposed connection between lake Ulungur and the Irtysh. Sosnovski and Matusovski are both of opinion that the Naryn-kara ridge completely separates the two. Sosnovski indeed mentions a native tradition according to which the body of an Uryenkh, drowned in the lake, was subsequently fished up in the Irtysh, a tradition very similar to that related of the Chushkaly Lake; but he is convinced that the lake now forms a continental basin of its own, though at some former epoch it undoubtedly belonged to the great Arctic basin of the Irtysh and Ob. Miroshnichenko, however, does not altogether admit this. The Naryn-kara, according to him, does not completely cut off the lake, for a depression, not unlike an old river bed, has been discovered in it, and he was told by the Kirgiz of the neighbourhood that occasionally, after heavy rains, the waters of the Ulungur are discharged through that channel into the Irtysh. He believes, moreover, that their exists at all times a subterranean connection between the two. The district between the lake and the Irtysh consists of loam, very much subjected to the erosive action of water. Miroshnichenko noticed several immense pits or cavities near the eastern shore of the lake. In 1872 the neck of land separating one of these from the lake was destroyed by the action of the water, which rushed into the pit and formed a bay 8 miles deep. By means of cavities, such as these, M. Miroshnichenko believes, a subterranean connection may well be established. He finds a confirmation of his theory in the volume of water carried past certain stations on the Irtysh. His measurements have yielded the following results:—

	Volume of water in cubic feet per minute.
1. At a spot 13 miles above lake Ulungur ...	36,000
2. Below the lake, but above the mouth of the Kran	125,000
3. Between Kran and Burchum, 1st measurement	156,000
" " 2nd measurement	156,000
4. Below the Burchum	597,000
5. Below the Kaba	793,000

No tributary joins the Irtysh between 1 and 2, and under ordinary circumstances, owing to the effects of evaporation and infiltration, the volume of water ought therefore to decrease. Instead of this a very considerable increase has been observed, too large to be accounted for by the existence of springs in the bed of the river, but easily explained if there exists a subterranean connection with the lake.

M. Sosnovski made some enquiries respecting the existence of volcanoes in Central Asia, but elicited nothing of importance. He was told by Uvan, a prince of the Torgod, that there was a place called "Jin," between the mountains Argalti and Deleun, in the district of Khobu-sor, to the west of lake Ulungur, where vapours rose continuously from deep fissures. Pits had been dug near these fissures, each about a yard deep and 20 feet in diameter, and these were frequented by people suffering from gout, rheumatism, cancer, and all kinds of skin diseases, who were cured after three immersions. This description evidently applies to a hot sulphur spring or solfatara, and not to a volcano.

M. Miroshnichenko determined the following positions astronomically:—

	Latitude N.	Longitude E. of Greenwich.
Zaisan Post	47° 26′ 25″	84° 58′
Mai Kapchagai, Russian outpost	47° 28′ 25″	85° 35′
Kapkhan Chilig	47° 24′ 28″	86° 31′
Tulta (Shara sume monastery) ...	47° 50′ 39″	88° 3′
Burul-tokhoi	47° 5′ 13″	87° 25″
Ulungur Lake, northern shore ...	47° 21′ 26″	87° 30′
Kran, mouth	47° 35′ 43″	87° 14′
Burchum, mouth	47° 42′ 28″	86° 46′
Kaba, mouth	47° 52′ 4″	86° 3′

He likewise determined the altitudes of numerous places barometrically, and that of Mount Sauru, to the west of the Irtysh Valley by means of angles. The latter rises to a height of 12,000 feet, and the snow-line descends 1000 to 1500 feet below its summit.

II.—MATUSOVSKI'S JOURNEY INTO THE EKTAG-ALTAI.

M. MATUSOVSKI'S explorations were chiefly directed to an elucidation of the hydrographical features of the southern offshoots of the Altai, known as the Ektag-Altai. He crossed the Irtysh at Ak Tube, near the Russian frontier, and thence traced the Koljir upwards for a distance of 11·3 miles, to the foot of the Bukumbai Hills. The valley thus far is perfectly level, the banks of the river are covered with dense woods of silver-poplars, ash, birch, willows, and acacias, and

there is much land fit for agricultural purposes. The Kirgiz of Koshembe's tribe irrigate a few patches by means of canals, and, in spite of their primitive methods of cultivation, their fields yield 15-fold and more.

Matusovski here turned to the east, and crossed successively the Tabyty Hills by a steep and stony path, the water-parting between Koljir and Belezek and the Azu Mountains (6000 feet), and on the 18th of July 1873, descended to Lake Marka-kul, whence the Koljir takes its rise. Whilst in the hills, the vegetation was limited to shrubs, but on descending the Azu Mountains in the direction of the lake the flora of the Altai burst upon our traveller in all its variety, and dense woods of conifers and foliferous trees covered the hill sides down to the very margin of the water. The shores of the lake and the valleys opening upon it were alive at that time with the kibitkas of the Kirgiz, and this enabled Matusovski to replace his worn-out and sick camels by fresh ones.

The densely wooded mountains, which rise steeply from the margin of the lake, do not admit of the passage of beasts of burden. Matusovski was therefore compelled to re-ascend the Azu Mountains. He then descended into the Chumak Valley, crossed the Jita Kaba or seven headstreams of the Kaba River, whose depth and rapid current considerably delayed him, and reached the Kamas Lake on the 28th of July. This lake lies in a deep and narrow hollow, at an elevation of 4600 feet above the sea. It is scarcely more than an enlargement of the river bearing the same name, about two-thirds of a mile wide and 11½ miles long. The mountains rise steeply from its shores and are covered with dense woods of conifers. Matusovski crossed the southern end of the lake on a raft, and then turned to the south-east, in the direction of Tulta, which he reached on the 9th of August. It required much persuasion to induce the Tsagan-kegen to permit Matusovski to continue his journey towards the east. At length he was able to start, and pushed his way for 93 miles into the country of the Kalmuks, as far as the Ku Irtzys, the most easterly head-river of the Irtysh. He then retraced his steps to the Kran, descended that river to the valley of the Irtysh, and, skirting the foot of the Altai, crossed the lower course of the rivers which on his journey out he had crossed higher up. Matusovski is of opinion that the country visited by him offers great advantages to colonists. The banks of the Kurtu (a tributary of the Kran), the Burchum, Kaba and Koljir, where at present only a few patches are cultivated, abound in pastures and woods, and offer every facility for the establishment of prosperous agricultural settlements on the largest scale. The Chinese begin to appreciate the advantages of these localities, and the Tsagan-kegen is said to be desirous of forming a settlement on the Kaba River, which would moreover enable him to bring back the nomadic Kirgiz to their former condition of dependence.

M. Matusovski is very sanguine with respect to the prospects of trade on the Upper Irtysh. The district bounded by the Ektag and Sauru Mountains has a population of some 45,000 souls. Up to 1869 the trade carried on there by Russian merchants was of a very limited nature. In that year the Chinese empire was thrown open to their enterprise, and the exports rose rapidly. In 1870 "permits" were granted at Semipalatinsk for exporting merchandise of the value of 119,616 rubel; in 1871 this amount increased to 140,112 rubel; in 1872 to 143,573 rubel, and in 1873 (up to October) to 218,995. Permits were likewise issued by the local authorities of the Zaisan and elsewhere, whilst many dealers do not trouble about permits at all. Taking every circumstance into account M. Matusovski considers that the trade done in 1873 reached a total of 600,000 rubel (56,000*l.*), and as the Russian trader in his dealings with the nomads has not to encounter the competition of the Chinese, he is able to realize a profit of 100 per cent. and more!

Matusovski has made a route survey of his journey, extending over 514 miles; he has determined numerous altitudes, and collected a vast amount of information with respect to the roads leading from the Irtysh Valley to Kobdo, and the encampments of the Kireyi and the Naiman tribe not subject to Russia.

III.—A Russian Caravan Journey to Kobdo, Uliassutai, and Barkul.

In 1872 M. Savva Morozof, a Russian merchant, despatched a caravan to Dzungaria and Western Mongolia. This caravan started from the Russian post near the Zaisan Lake, and having reaced Bulun-tokhoi on the Urungu, a distance of 266 versts (153 geo. miles) from Zaisan, it visited successively Kobdo, Uliassutai, Guchen, and Barkul. The Mandarins of the latter town refused to admit the Russians. They averred that their town was in Kansu, and not in Mongolia, which alone had been opened to Russian traders. The leader of the caravan therefore returned by way of Guchen to Bulun-tokhoi. The following notes respecting this journey were obtained by M. Sosnovski from the leader of the caravan.

I.—Bulun-tokhoi to Kobdo.

	Versts.		Versts.
1. Burul or Bulun-tokhoi (47°5′N., 87°25′E.), to Koldynen-terek, on right bank of Urungu . .	17½	13. Temple of Karashor (a Khan of the Khoshotes)	10
2. Kara-magoi (village and post)	16	14. Shashgai (post) . .	22
3. Den-ergei (post) . .	35½	15. Jungul (spring in mountains)	31
4. Den-ergei-budu (post)	15	16. The Great Ulan-Dabaga	13½
5. Dúro (post)	27	17. Dabust-Dabusyn (salt lake and spring) . .	24½
6. Dúro-uba (post) . .	35	18. Sisiknur (spring) . .	14
7. Zakhuba (post) . .	22	19. Buchun (spring) . .	29½
8. Charkutai (post) . .	19	20. Sunshi (rivulet) . .	22
9. Chingil (river) . . .	39	21. Sunshi (lake) . . .	14
10. Bulgun (river) . . .	31	22. Kara-su (large lake) .	18
11. Choru-usun (post) . .	22	23. Khobdo (town) . .	22
12. Shar-khusun (post) .	18		
		Total . . .	517½ (298 geo. miles).

The road throughout is good and practicable for carts. The posts merely consist of a few huts inhabited by three or four soldiers, who serve as guides and carry the mails. Beasts of burden may be procured amongst the Kalmuks and Uryankhes near the road. As far as Charkutai the road follows the right bank of the Urungu River, the banks of which are covered with meadows and woods, the wild olive-tree predominating. The river averages about 100 feet in width; its current is slow, and it can be forded at many places even after the spring floods.

The camping-grounds of the Khoshotes, a numerous and wealthy tribe, are met with on the rivers Chingel and Bulgun, the banks of which are covered with small poplars and ash. On reaching the Bulgun the road follows the right bank of that river as far as the temple

of Karashor, where it crosses to the left bank. The temple is a large building of stone.

During the following days' journeys, as far as the Sunshi Lake, fuel was found only in small quantities. The great Ulan-Dabaga is a pass over a branch of the southern Altai. It is practicable for led animals; carts cross by a path further south. The Altai terminates here, and to the south of that pass there are only detached hills.

II.—KOBDO TO ULIASSUTAI.

	Versts.		Versts.
1. Kobdo to Kara-su (lake)	28½	9. Zergö on Jabgan River	19
2. Same lake	21	10. Baga (spring)	19
3. Sakhgub spring, on crossing the Araftübe Mountain	26½	11. Ike (on Jabgan River)	19½
4. Zerglyndy spring	26½	12. Khutun-chulak (on same river)	19
5. Khar-gryn	25	13. Brukh (post on Uliassutai River)	28½
6. Durganor (salt lake)	25	14. Aldyr (post on Uliassutai River)	22
7. Arglynty (well, cross a desert)	35	15. Uliassutai (town)	16
8. Bogotu (a rivulet, after having crossed a desert)	27	Total	357½ (204 geo. miles).

This road was explored in 1870 by M. Matusovski, and subsequently by Mr. Ney Elias (*Journal Royal Geographical Society*, vol. xliii.).

Uliassutai had not yet recovered from its destruction in 1870, but the authorities are resolved to reconstruct it, and materials had been collected for that purpose.

III.—ULIASSUTAI TO BARKUL.

	Versts.		Versts.
1. Uliassutai to Aldyr (post)	16	12. Armuga (spring)	26
2. Brukh (post)	22	13. Barlyk (post)	24½
3. Khozyr-urta (post)	19	14. Shir-urta (post)	39
4. Khozyr No. 3 (post)	17½	15. Khuiny-su	22
5. Pichigan (station)	31	16. Khayir-khan-bulak (spring)	39½
6. Nur-muga (spring)	15½	17. Sukhatu (post)	26½
7. Nur-urten (spring)	15½	19. Karasu (settlement)	65½
8. Kuis-urten (well)	22	20. Barkul (town)	26
9. Bayengul (spring)	43		
10. Bulgun-urta (spring)	17½	Total	519 (298½ geo. miles).
11. Sisiknur (lake)	31		

The river Uliassutai is crossed on the road to Khozyr-urta, and the Jabgan at Khozyr No. 3. At both these places grass and fuel abound. Pichigan affords neither, and water likewise is scarce. The two following springs are in the midst of meadows. At Bayengul there are extensive salt-swamps, and Bulgun-urta spring flows into a small salt lake. Some hills, of no great height, are crossed near that place, and the road then turns towards the left (south-east). Halfway to the Sisiknur Lake there is a spring. The water of the lake is brackish, but forage is found near it. The road thence, as far as the Armuga spring, is stony, but level. The three following pickets lie in the hills, near small springs. There is but little forage. The summits of the hills and detached heights are covered with shrubs of larch. Half-way on the road to the Khayir-khan-bulak spring there is a gold mine, which was formerly worked on Government account. The works have been stopped, owing to the unsettled times, but a guard of sixty Chinese soldiers is maintained, nevertheless, to keep off private adventurers. Sukhatu is built on a rivulet, in the midst of a wood of considerable extent. Forage is but scarce there. The road thence to Karasu leads over a plain covered with a crust of salt. Karasu has about a thousand inhabitants, Chinese and Mongols. It lies at the foot of a hill, in the midst of orchards yielding pears and apples. The inhabitants till the soil, and grow principally wheat, which yields a bountiful return. Barkul, which the members of the caravan were not allowed to enter, is a very large place at the foot of snow-covered mountains, which are visible already half-way from Uliassutai. It has a strong Chinese garrison, and two citadels. Hami (Khami) is three days' distant, and thence to Lan-chau, the centre of the rhubarb trade, is twenty days' journey.* Khami has three forts. The nearest places occupied by the Dungans are Su-chau and An-si (Ngan-si-fan), both to the south-east, in Kansu.

IV.—BARKUL TO GUCHEN.

	Versts.		Versts.
1. Barkul to Shir (post on a spring)	16	9. Tuntu (post)	22
2. Bizi (do.)	22½	10. Khulutunga (post)	19
3. Chi (well)	22	11. Khuchun (post)	22
4. Spring in mountains	18	12. Khuchun (village)	27½
5. Spring on leaving mountain	26½	13. Deserted post in the territory of the Torgout	17½
6. Sugdu-guburn (station)	17½	14. Ruins of Chitoi	31
7. Burnty (post in mountain)	22	15. Guchen (town)	22
8. Sukhatyn (post)	18	Total	323½ (184½ geo. miles).

This road, though practicable throughout for carts, has been abandoned in consequence of the rebellion of the Dungans. It leads across numerous low off-shoots from the Thian-shan, which are generally wooded. Guchen lies on a small rivulet; timber is found in its neighbourhood. The ruins prove that it has no more escaped the consequences of the Dungan rebellion than other towns, but new buildings are springing up fast. Chitoi and Zimsa, the latter 30 versts in the direction of Urumchi, have suffered the same fate, but all these towns are held now by strong garrisons. At Guchen and Zimsa the caravan did a satisfactory amount of business, taking principally silver in payment. Zimsa is a considerable place, on the banks of a large river, and near the wooded Khuisan-bugda Mountains. From Guchen to Urumchi is four days, thence to Turfan five days. At the latter place large quantities of wool had been stored up. One day's journey this side of Urumchi there is a large town named Khozmudi, whence there is a direct road to Manas. There were about 300 peaceable Dungans at Guchen during the stay of caravans there, who kept cookshops and engaged in trades, but when the news arrived that Kobdo had been captured by the Dungans, the Amban had all of them executed.

V.—GUCHEN TO BULUN-TOKHOI.

	Versts.		Versts.
1. Guchen to Kara-agach (Kara-muta), a spring	17½	8. Kara-tugal	10
2. Station near desert	13½	9. Tugut-ulan-kharan	17½
3. Kuchkanur lake	22	10. Ulan-Khuyerkhan, near the Tulba-uba mountain	18
4. Deserted post Taimyst-naiman-shur	26½	11. Charkutai (post)	19
5. Deserted post Kobusty	22	19. Bulun-tokhoi (same as route 1)	187
6. Kobuk or Kubka (spring)	17½	Total	392½ (184½ geo. miles).
7. Kustal-Kuchektal	22		

* Lan-chau-fu, according to the Jesuits, lies in latitude 36° 8′ 24″ N., longitude 103° 55′ E.; according to the Ta-tsing Atlas, in 36° 5′ 24″ N., 103° 54′ E. Hami, according to the latter, is in 42° 53′ N., 94° 35′ E. The distance between these two places would therefore amount to 1200 versts, which could hardly be accomplished in twenty days.

The road throughout is level and practicable for carts; there is good forage, and wood for fuel, and water are found in sufficient quantities.

IV.—NOTES ON OUR SKETCH MAP.

Our Sketch Map is intended to illustrate the accounts printed above, and does not embody the whole of the information available with respect to the country delineated. It is based upon the points determined astronomically by Struve and Miroshnichenko, and embodies a good deal of the information contained in the Russian staff map of Central Asia (edition of 1874), and of Veniukof's map of Mongolia. The positions along the road from Uliassutai to Suok have been laid down from Mr. Ney Elias's map, but a number of names has been added from Russian sources, which serve to supplement the topographical detail of Mr. Ney Elias's map. We have likewise inserted a large number of altitudes. In doing this we have discovered a considerable discrepancy in the height of Suok as determined respectively by Mr. Ney Elias and M. Miroshnichenko. According to the former that Chinese picket is at an elevation of 6302 feet above the sea level, whilst the pass to the north of it attains a height of 8550 feet. Miroshnichenko, whose work is generally considered to be very trustworthy, places Suok at an elevation of 8504 feet, and the Bol-Tsir Pass at 9707 feet. The difference between the two observers thus amounts to 2202 and 1157 feet respectively.

A TURKISH ACCOUNT OF YEMEN.*

A WORK recently published at Constantinople contains a valuable account of the history and geography of Yemen, all the more interesting to English readers on account of the complications which arose some time ago with reference to the protection extended by the British Government to the Arab tribes dwelling in the vicinity of Aden.

The year 1635 saw the downfall of Turkish power in Yemen, and until within the last few years the Turks merely held a few places along the coast. The opening of the Suez Canal impelled the Government of the Porte to turn its attention to these neglected provinces. The canal in the hands of the French, Aden and Perim in those of the English, might place the Turks in a critical position, should these two powers combine for hostile purposes. Yemen might then fall an easy prey to them, and they might even threaten Mekka and Medina, the sacred sites of Islamism, the possession of which insures to the Sultan his pre-eminence amongst Muhammadan sovereigns.

These considerations influenced the councils of the Turkish Government, and when Muhammad-bin-Aidh, the Emîr of Asir, expelled the Turkish garrison from Hudeide, in 1870, it was resolved to despatch an expeditionary force, not only to punish him for his audacity, but also to restore the sovereignty of the Porte throughout the whole of South-Western Arabia.

Mehemid Redif Pasha, at present Governor of Bagdad, was placed in command of the troops, who landed on the 11th of February 1871, in the harbour of Gunfude. The conquest of Asir was accomplished in the course of that year. The enemy generally retired after exchanging a few shots, and the losses on the field were not severe. But cholera, fevers, dysentery, and sunstroke, as well as the fatiguing marches through the burning sands of the Tehama, and the rocky mountains of Jebal, cost a good many lives. In November, however, a civil government had been established, Turkish garrisons held the most important places, and the bulk of the troops were about to start for Yemen, when the pusillanimity of the newly-appointed civil governor put a stop, for a time, to further operations. This exemplary government official was afraid to trust his precious life in so dangerous a country, and failing to get a certificate of ill-health from the regimental surgeons, which would have enabled him to return to Constantinople and its attractions, he rendered himself up to complete inactivity, and thus imperilled the conquests made. Under these circumstances the commander-in-chief insisted upon his dismissal, and the troops only left after his successor had been installed in office. Redif Pasha, having contracted a serious illness during the siege of Ride, the principal stronghold of Asir, now returned to Constantinople, and the command of the invading army devolved upon Ahmed Mukhtar Pasha.

Early in the following year a landing was effected at Hudeide, and on the 16th of March 1872, the army left for the interior. During the first few days, owing to the excessive heat of the Tehama, the troops only marched during the night. Their progress in the direction of Sana was checked soon after they entered the mountains. The Ismaelites, who had established themselves in the district of Haraz, offered a spirited resistance. One hill fort after the other was captured, and in April 1872, after a nine days' bombardment, the Turks succeeded in gaining possession of Atara, the chief stronghold, and with it of the persons of Hasan bin-Ismail, the Dai or religious leader of the sect, and of his two sons. They all three died soon afterwards at Hudeide, from typhus, it is said, and as the father had attained an age of 130 years, whilst one of his sons was epileptic, and the other idiotic, there is no reason to suspect foul play.

Sana, the capital of Yemen, voluntarily opened its gates on the 25th of April. Mühzin Shehari, a descendant of the Imams of Yemen, had kept this town in a state of blockade for a number of years, but the Bedwins, who acknowledged his authority, were incapable of resisting the rifled cannon and needle-guns of the Turks, who were hailed as liberators by the inhabitants of the town.

The conquest of the remainder of Yemen was effected by four smaller bodies of troops.

1. The hill forts in Kaukeban mostly fell an easy prey, but Kaukeban itself, favoured by its extraordinarily strong position, resisted for six months, and only surrendered on the 24th of November 1872. It had been besieged according to all the rules of military art, and the most remarkble work of the engineers consisted in a bridge thrown across a fearful precipice. The districts to the north of Kaukeban were subdued by the end of January 1873.

2. The district of Reme, to the east of Hudeide,

* *Tarikh-i-Yemen ve Sana*, by Colonel Haji Rashid Bey. Constantinople, 1875. We are indebted to the pages of the *Allgemeine Zeitung* for a knowledge of the contents of this work. Its translation into English by one of the *attachés* of the embassy at Constantinople is much to be desired.

which is inhabited by 153 different Arab tribes, occupying about 900 villages, was conquered by a column commanded by Haji Rashid Bey, the author of the work under notice, who accomplished his task by the middle of June 1872.

3. Southern Yemen, including Taāz, was captured by a body of troops, who started from Mokha on the 22nd September 1872.

4. The conquest of Anes, to the south of Sana, was accomplished in December and January.

The subjection of the intervening districts, and especially of the whole of the coast, had been effected by the end of April 1873, and the conquest of the larger portion of Yemen thus occupied only fourteen months. The districts of Marib, Yam, Zaade, and others in the east and north-east, do not, however, as yet acknowledge Turkish rule, and the conquest of Lahej, in the south, was frustrated by the threatening position assumed by England.

The number of troops engaged in these campaigns was 22,000, of whom about 4000 died between Jan. 1871 and April 1873. Of these 4000 only about 300 were killed in battle, or succumbed to their wounds, 1700 died from cholera, and the remainder from other diseases.

The conquered territory now forms the Vilayet Yemen, and is occupied by the seventh army corps, specially organised for that purpose. The capital is Sana. The Vilayet is divided into four Livas, and these into twenty-three Kazas, as follows :—

I.—LIVA SANA, Capital SANA.

1. Jebel Haraz.—Menakha (capital), Sa'fan, Mefhak, Orr.
2. Kaukeban.—Kaukeban (capital).
3. Amram.—Amram (capital), Beit Mukaddem.
4. Anez.—Hanuran (capital), Jehran, Othuma.
5. Yerim.—Yerim (capital), Ammar.

II.—LIVA ASIR, Capital MAHAIL.

1. Ebha.—Menadhir (capital), Hali, Shehran, Refidet el Yemen.
2. Sabia.—Sabia (capital), Dharb u Shakik, Umm el Hashab.
3. Rijal el Ma'.—Betile (capital).
4. Gunfude.—Gunfude (capital), Duga.
5. Beni Shehir.—Tenumu (capital), Bishe.
6. Gamid u Zohran.—Ragdan (capital).

III.—LIVA TAAZ.

1. Taāz.—Taāz (capital), Zi Sefal, Hojerie (a tribe).
2. Mokha.—Mohka (capital), Khur Sheikh Said (opposite Perim).
3. Aden.—Aden (capital).*
4. Medinetein.—Aebb (capital), Mekhadir.
5. Ka'taba.—Ka'taba (capital), Hauashib (a tribe).

IV.—LIVA HUDEIDE.

1. Hudeide.—Hudeide (capital), Abes, Melham, Haffash, Be'ra, Beit el Fakih.
2. Abu Arish.—Abu Arish (capital), Jezan.
3. Zebid.—Zebid (capital), Hes.
4. Luheia.—Luheia (capital), Zahra.
5. Jebel Reme.—Jebbi (capital), Ja'ferie, Küsme, Selfie.
6. Bajel.—Bajel (capital).
7. Zeidie.—Zeidie (capital).

The population of Arabia is estimated by the author as follows :—

Yemen and Asir	2,252,150
Hadhramaut	1,550,000
Oman and Maskat	1,350,000
Nejd (Bahrein, Katif, Ahsa, Deraya)	2,350,000
Hijaz, Aneze, Tehama of Hijaz, Belad i Kasam a Jebel Shamar	3,250,000
Total	10,752,150

* Aden is thus looked upon by the author of this book as a portion of the Turkish dominions. The Hauashib mentioned further on are a tribe under British protection. This prospective geography may possibly lead to certain inconvenient questions being asked at Constantinople.

The author furnishes his readers with a full description of Yemen and Asir, based to a large extent upon personal observations, and renders an interesting account of the natural productions of the country.

We trust his work will find a translator.

PARAGUAY.

AMONG the republican states of South America, the financial difficulties of which have recently given them such unenviable notoriety, Paraguay, the earliest of the Spanish colonies of the great basin of La Plata, has a high interest both on account of the vicissitudes of its past history, its present straits, and remarkable position politically and socially. A few words may suffice to recall to the reader the leading features of its former story.

In their search for the rumoured El Dorado, the Spanish adventurers of the beginning of the 16th century, led on then by their countryman Sebastian Cabot, were the first to sail up against the rapid current of the great river Paraná, and to discover the branches of this waterway into the heart of South America. On its tributary, the Paraguay, they founded the city of Asuncion (in 1536), which for the greater part of a century was the chief place of the Rios de la Plata, the seat of the Captain-General, and the centre from which radiated all efforts at the subjugation of the native Indian tribes, and all further search after the fascinating golden regions of the north-west. It was not till the beginning of the 17th century that the countries south of the confluence of the Paraguay and Paraná were separated from the Government of the northern territory which still bears the name of Paraguay. To the rule of the gold-seeking soldiers of Spain followed that of the Jesuit fathers, whose influence nowhere extended so rapidly as in South America, and nowhere on that continent so marvellously or with such favourable results as amidst the tribes of the mild race of the Guarani. For upwards of 150 years, under Jesuit discipline, a state of civilization in which not only agriculture, but several of the minor arts flourished, was maintained among the Indian population of the South and East of Paraguay. On the expulsion of the fathers (in 1768), the missions drooped, and the Indians for the most part retired again from the villages and fields to the wild forest.

The date 1811 is celebrated in Paraguay as that of the "first day of liberty," when that country asserted its independence not only of Spain, but also of the other States of La Plata. A few years later this liberty and independence of the people of Paraguay were exchanged for abject submission to the stern dictatorship of Dr. Francia, whose policy of non-intercourse closed the country to the outer world for a quarter of a century, only two of its river ports being open to trade, and that only under special restrictions. To him succeeded, in 1844, the elder Lopez, as president of the republic, retaining an authority not less absolute and unquestioned than that of Dr. Francia, but exercising it in a more liberal policy, opening the rivers to foreign trade and gradually improving the condition of the people. The career of the younger Lopez must be freshly remembered: in the earlier years of his presidency he certainly carried on that policy of advancement and improvement, which, if it

had been allowed to last for a few years longer, must have raised Paraguay to a first rank among South American powers. The country was wealthy and without debt, and well stocked with cattle; roads and posts were well maintained throughout the western portion. Railways were planned and Europeans engaged to instruct native artisans; law and order were most strictly upheld. Fired by the ambitious desire to found an empire on the Paraná, and trusting to the internal strength of his country, Lopez began that fatal seven years' war with Brazil and the Argentine Republic which more than decimated the population of Paraguay, and so completely ruined the land as to make recovery appear almost hopeless. So strong was the country, so full of wealth and resource, that it could hold these opposing powers at bay for seven years, and so completely had the doctrine of submission been instilled into the people from the times of Francia, that Lopez could drain the land to the last dregs of its life and materials, before he himself was killed, after being driven, with the last handful of men, slowly backwards into the far interior of the country.

On the conclusion of the war in 1870, a provisional Republican Government was formed by the remnant of the Paraguayans, which a year later took a more permanent form. It was at this time, and with a view to recoup in some degree the disasters and miseries brought on by the war, that loans from England were sought. What with doubtful transactions in England, and simple robbery of the amounts which reached Paraguay, these loans have not tended in any way to forward the object with which they were planned, but have rather had the effect of completely ruining the credit of Paraguay. Several revolutions have disturbed the country since the war, overturning the existing Government in almost every case, and still farther, wearing out the little strength remaining to the land. After the war, Brazil and the Argentine Republic each maintained a garrison in Asuncion, in support of the obligations due to these powers as the conquered country; the Brazilian garrison of about 6000 men still remain, but in the middle of last year the Argentines retired to their settlement of the Villa Occidental (originally the French colony of New Bordeaux), a little way above Asuncion and on the Chaco side of the Rio Paraguay. The last revolution was that of April 1874, when Asuncion was invested by an insurgent force quite strong enough to have very easily overturned the Government in the city had it not been for the presence of the Brazilian troops there. The Government appealed to the Brazilian minister, who then for the first time interfered actively in procuring the peace of the country by permitting the force in garrison to march out and disperse the revolutionary force.

The question of the limits of Paraguay with Brazil, long disputed, was decided by treaty in 1871, and the frontier on that side has been carefully surveyed and marked out by a commission which was in operation during 1873-74. The line runs along the Rio Apa to its source (the Estrella), then along the water-parting of the central cordillera to where it meets a lateral ridge forming the south side of the basin of the river Ygatimi, along which minor parting the boundary runs to the Salto Guayrá on the Upper Paraná. Till very recently, however, several questions of limits remained to be decided between the Argentine Republic and Paraguay: the latter claimed the province of Missiones on the Argentine side of the Paraná, the island of Cerrito or Atajo, at the confluence of the Paraguay and Paraná, commanding the mouth of the former river, besides a space of the vast unknown plain of the Gran Chaco northward from the Rio Pilcomayo to the frontier of Bolivia. These disputed points appear to have been decided now at Rio Janeiro by the Brazilian Government (on behalf of Paraguay), and an envoy from the Argentine Government. The Southern Missiones and the island of Cerrito henceforth belong to the Argentine Republic, and it has been left to arbitration to decide the proprietorship of the Chaco north of the Pilcomayo. Since Paraguay is not only unable to occupy any part of the Chaco territory, but cannot prevent the encroachments of the wild Chaco Indians, who, knowing the weakness of the country, come across the Rio Paraguay from this very disputed area to occupy the more fertile lands of the eastern side, it does not seem probable that the award will be in favour of the feebler republic.

Paraguay, shorn of its exterior claims, thus remains a compact area girt about by the Upper Paraná and Paraguay Rivers, comparable in extent with England and Wales. A central cordillera of moderate elevation (1000 to 2000 feet), running parallel to the great rivers, divides the country into two slopes, an eastern and a western. The western shed to the Rio Paraguay, characterised rather by wide grancampos than by forests, and traversed by several navigable tributaries of the Paraguay, is the civilized side of the country; the opposite slope to the Paraná, a region of dense forests, is inhabited by scattered Indian tribes, remaining very much in a primitive condition, undisturbed by the movements on the opposite half of the country.

The population of the western slope, mixed Spanish and Indian, is believed to have been about a million and a half before the war, but does not now exceed one hundred thousand, so great was the destruction of life during the contest: of those remaining, about 80 per cent. are women. Many of the outlying districts of this side, south and north, have been completely deserted since the war, the people drawing in to the more central lands round the capital. No even approximately correct estimate of the numbers of the independent Indians of the Paraná side, Canguás, Tupi, and Guayanas, can be made, but there are probably not less then 10,000 of these.

Worn out by war, its population decimated, burdened by enormous debt, and ruined in its credit, the natural resources of Paraguay would need to be great indeed to enable it ever to recover an independent position. Let us glance at the chief of these possible aids to future recovery. Nearly three-fourths of the cultivated lands of the western side of Paraguay are owned by the Government: the larger portions lie to north and south; in the central districts public and private properties are mixed in apparently inextricable confusion, a tribunal judging claims to land which may have been confiscated in earlier times by Government, or which may have been abandoned by their owners during the war, now in session at Asuncion, was an arduous task. The country is eminently fertile, possessing immense tracts of rich pasture land: its capabilities as a cattle-breeding country were well proved by its wealth in this respect before the war. At present there may be said to be no native cattle in

the country: the whole of the meat supply for the districts about the capital is in troops of oxen, driven from the Argentine province of Corrientes, which cross the Paraná by various passes and make a long and tedious march through the southern esteros of Paraguay, to the markets of Asuncion and Villa Rica. Provided that the country was in the hands of a stable Government, there could be no more favourable object for the introduction of capital into Paraguay than for that of cattle breeding.

The value of the forest timber of Paraguay and the almost indestructible qualities of most of its hard woods are well known, and the supply is inexhaustible. At present a considerable quantity of squared timber is sent down in rafts from the interior tributary rivers of the Paraguay, to the lower towns of the Paraná. As population and building increase in the timberless grass plains of the Lower La Plata, this industry must grow in proportion. The special product, however, of the country, the export of which has always been its mainstay, is the Yerba maté or Paraguayan tea. This is not a cultivated product in any sense: the bushy evergreen tree which yields it is scattered more or less thickly all through the forests of the central cordillera, and the processes of tearing down the branches and twigs, of drying and pounding the leaves, and packing these into hide bags, is carried on in the rudest and most clumsy fashion. If capital were introduced into this industry, by means of which roads might be made to the Yerbales, the forests cleared of undergrowth to allow free access to the tea trees, and suitable appliances contrived for the preparation of the yerba, the tea might, it is believed, be produced not only in a much superior and surer way, but at about half the present cost. Although China tea has now to some extent taken the place of yerba as a beverage in the towns of the river Plate, yet in the interior camps maté is still exclusively used, and though yerba grown in the southern provinces of Brazil competes there with that from Paraguay, yet the latter is of finer quality and is always preferred.

Every little rancho throughout Central and Southern Paraguay has its patch of tobacco; the bulk of this harvest is collected by Corrientine traders, but very little of the last gatherings, the best leaf, ever quits the country. Cigars are manufactured to a considerable extent for export, and some of those made in the neighbourhood of Villa Rica have been sent in some quantity to England, it is believed with success, though the tobacco used in their manufacture is very inferior and much below the average.

Neither coffee nor indigo are now grown in Paraguay, though many districts are admirably suited to these products: the native cotton of good staple is used entirely in domestic manufactures, woven into strong coarse cloth in rude handlooms, or made into the hammocks which are in use all through the country. The sugar-cane is not very widely grown, and might be cultivated on a large scale with success. Molance or "miel" forms an important article of food with all Paraguayans, and the white rum, or *caña*, distilled from the fermented juice, is a pure and wholesome spirit much prized in the down-river countries; indeed, everything that is Paraguayan is held in high esteem on the lower river Plate. Paraguayan men, by their courage and endurance during the war, have earned for themselves great respect. Paraguayan yerba, tobacco, and caña are far preferred to the Brazilian.

Attempts at European colonization in Paraguay have hitherto failed. The summer climate is certainly unsuited to the European agricultural labourer, though the proportion of toil necessary to be expended on the land is small in comparison with that of a colder region: but the failures seem to have been attributable rather to the choice of men for colonists, who were quite incapable of aiding themselves in any country, than to any circumstances of soil or climate. Two or three colonists who remain in Paraguay, men of previous agricultural experience, have sufficiently proved the possibility of European colonization, being now settled independently in their own ranchos, surrounded with good patches of land cultivated by their own hands, and yielding a fair return. It is not probable, however, that in the face of the lamentable failures of the several efforts of European colonization that any further schemes of this sort will be proposed: the introduction of coolie labour has on the other hand been spoken of, and in no country could the conditions be more favourable for such immigration. The Chinaman's talent for rice-growing might have unlimited scope in the vast "esteros" of the former missions. The mineral wealth of Paraguay is not great: iron was worked on a small scale in the time of Lopez; gold has been found, but in quantities too small to repay working, though it has been sought for diligently by experienced men in all likely districts; coal may possibly be found at some future time in the central cordillera; a few seams of useless shale are only known at present.

The old dream of El Dorado, however, still haunts the people of Paraguay, who can conceive no other motive of travel in their country than the search for gold; the sextant and barometer were always looked upon as implements for divination of the presence of the precious metal.

Capital and labour are both utterly deficient, but it is to the sources of wealth which are already patent that the country must look in any attempt to recover from its present condition, whether it is to be again an independent republic or a protectorate or province of the Empire of Brazil.

KEITH JOHNSTON.

A TRIP UP THE CONGO OR ZAIRE RIVER.

THE second number of the *Geographical Magazine* (May, 1874), contained a paper entitled "My Parentage and Early Career as a Slave," by my old factotum and companion, "Selim Agha." The public was somewhat startled by the style and tone—in fact, those who noticed the article generally declared that it had been written by a European, and not a few suspected that it was by myself. The editor, who had seen the manuscript, inserted a disclaimer in the June number (p. 120), and there the matter ended.

I here offer a second paper by my *compagnon de voyage*, with a few words of personal notice.

Selim Agha el Tegalli was born in Tegallat, about 1829; the date, of course, is vague, but he was certain that in 1836, when taken to Scotland by my venerable friend, the late Robert Thurburn, H.M's. Consul for Alexandria, he was a lad about

ten years old. There he learnt to speak English, or rather Scotch, with the true Lowland accent; and he became strongly affected towards Presbyterianism. It has been his fate to wander far and wide over Europe, Asia, Africa, and South America, ever pining for a cottage in Scotland, where he would have accounted himself

"Passing rich on forty pounds a year."

In 1860 he returned to his natal continent, after volunteering personally to ascertain the facts concerning the murder, in Waday, of Dr. Vögel, attached to the Central African Expedition. The late Sir Roderick Murchison and others were favourable to the plan, but they at length determined that all measures should be left in the hands of the late Dr. Baikie. In 1861 "Selim" became myfactotum, and he accompanied me in many expeditions to the Western Coast, especially to the summit of the unexplored volcano known as the Camarones or Cameroons Mountain, and, as the following paper proves, to the Cataracts of the Congo. When I left Fernando Po, in 1865, he resolved to travel towards the sources of the Niger, and the last letter which he wrote to me was from Liberia.

Selim Agha did not belong to the Guinea Coast, or the Congo people, most familiar to Europe and to the Southern States of North America; he boasted of the old semi-Semitic Abyssinian blood, in former times mixed, doubtless, with that of the half-Arab Bedawin, who still feed their flocks near the western shores of the Red Sea. He thus belonged to what I have called the noble tribes of Africa ranging between, and north of, the Mandengas (Mandingos) of Western, and the Somal of Eastern Ethiopia. The distinction is ignored by the many theorists who do not "approve" of a difference so striking to every traveller. Physically, he was a type of the mixed race. With short curly hair, and coal-black skin, his head and face as far as the nostrils were distinctly Arab; the rest was as clearly African. His thin and sinewy limbs were those of the Berber, whilst the feet and hands suggested the Msawahili. Such are the men who prove how much can be done for the African by good European training, and who, like the "Pundits" lately known to fame, can freely penetrate into the central parts of Nigerland, so dangerous, if not deadly, to white men. And these are the races who, extending southwards, with slow but regular advance, will, after many generations, mix their blood with the tribes typified by the Congo; will spread Islamism through the "Heart of Africa," and will pave the way for a higher civilization. The process must take time, and mankind is impatient. But it will be effected by the normal method, familiar to all students of history, the higher race impressing its superiority upon the lower; its development will not depend upon the adventitious action of consuls and cruisers, and it will owe nothing to the irregular and spasmodic operation of enthusiasm and philanthropy. It has already cast a ray of light athwart the gloom of the Dark Continent, and the morning will presently dawn with promise of full and perfect day.

And now my factotum shall speak for himself. I leave his manuscript at the office of the *Geographical Magazine*, to prevent all suspicion of its being written by any one but "Selim Agha."

RICHARD F. BURTON, F.R.G.S.

BEFORE starting on an exploratory journey into any part of Africa, it is essential that the traveller should be properly equipped and provided with the necessary kit both for the inward and outward man; clothing, blankets, and waterproofs of every description; tea, coffee, and sugar if the latter is desirable; a few bottles of genuine cognac, or some ten-year old Jamaica rum. Well equipped with these necessaries, we started from Fernando Po on the 29th of July for the purpose of ascending the Congo. H.M.S. 'Torch' (Captain Smith) took us down to Loango Bay, and there we were transferred to the sloop-of-war 'Zebra' (Captain Hoskins), which took us to St. Paul's, where we boarded the 'Griffon' (Captain Perry). This latter vessel took us to the Congo, and forthwith we commenced a start up the river on the 31st of August. The usual mode of ascending the river as far as Embomma is by means of small fore-and-aft schooners, of about 40 tons burden, which are heavily sparred and well supplied with canvas. Our gear was taken by the 'Griffon's' boats to M. Parrat's factory, and there put on board the French schooner 'Esperance,' the native captain of which was a Cabenda man of the name of Frank. We had a fine breeze that afternoon, and the 'Esperance' sailed up the river most gallantly. The party on board consisted of Consul Burton, Captain Perry, Mr. Bigley, and M. Pisseaux; a boatswain, four assistant boatswains, captain's servant, the consul's steward Selim, four French native soldiers, and a crew of eight men and boys besides the captain. The following morning we breakfasted at a Portuguese factory, and soon after weighed anchor, and sailed up the river, arriving betimes at Porto da Lenha, and anchored opposite the fine commercial residence of Senhor Monteiro.

On the afternoon of Wednesday (2nd of September) we left Porto da Lenha, and proceeded on our journey, passing several villages. During the night we rounded Point Devil, a most dangerous place for navigation. The following day, about noon, we arrived at Embomma, which contains a French factory and several Portuguese establishments. No white man had been living at the French factory for the last fourteen months, as the emigration system had been abolished. Many of the Portuguese had also deserted their factories, allowing them to decay.

Saturday 5th.—The expedition paid a visit to the king of Embomma, and on Sunday we visited Senhor Pereira's gardens, which were very finely laid out, and contained almost every European vegetable. Leaving Senhor Pereira's, at 3.50 P.M., we came to a dangerous bend in the river, where the rocks were visible on the surface of the water, and the current so strong that we had great difficulty in pulling against it. In about two hours we reached the entrance to the creek, which leads to the king of Embomma's village. The reach between this and the Lightning Rock, a little below the European factory, is about 8 miles. At 8.15 we arrived at King Nesalla's village, and having settled an altercation with the canoe-men, who wanted more pay, we made a fresh start.

Early next morning we stopped, and rested till dawn, starting again at 6.30 A.M. The country is hilly, and the river about three-quarters of a mile wide. After journeying for two hours we halted and breakfasted near the Alecto Rock, so-called from some of the 'Alecto's' men having painted a

white trident on it. At 9.30 we again got under weigh, and soon entered a part of the river where it assumes the appearance of an inland lake, some parts being nearly 2 miles wide. Near the upper end are two islands, the lower of which is very small, and has a single large tree growing upon it, which makes it very picturesque. The scenery here is varied, but principally hilly, the highest of the hills being about 1500 feet above the level of the river. Opposite the tree island we met a native chief in his canoe. He came to levy contributions from us. His people, who were armed with guns and matchlocks, made various warlike gestures, and ordered us to stop. M. Pisseaux, being our guide and adviser, we were compelled to pay one bottle of rum, and a piece of cloth 12 fathoms in length. The grass was dry all over the hills, that close to the water's edge being an exception; and very little animal life was perceptible, consequently the country presented a very barren and desolate appearance. Most of the trees were stunted and leafless, the chief of them being the baobab or monkey-bread tree, the fan-palm or palmyra, a few palm-nut trees, and a species of large spreading tree well scattered over the shores, the leaves of which are of a dark green colour, about the size of the lime leaf, and its fruit a long reddish plum, said to be eaten by monkeys. In the afternoon we arrived at another opening in the river, which extended and widened some 3 or 4 miles to the left, and was apparently hemmed in by a very high range of hills. This was the limit of M. Pisseaux's knowledge of the river, and, to our future sorrow and vexation, we landed in the banza or district of Nokki.

Next day (Tuesday, September 8th) we journeyed into the interior, and found the road excessively irksome and trying; nothing but hills and dales. Passing one or two fields of native beans, we arrived at the village of Kindemba, having crossed two places where water was procurable, the one a running stream, and the other a spring oozing out of the ground close to some rocks. After resting here for a short time we ascended a hill some 600 or 700 feet in height, and came to another village, where we saw something like a large baracoon for slaves, but which turned out to be a fetish house for circumcised boys. Not many minutes' walk from this is the village of Kayé, on entering which all our things were put down, and we were marched off to see his majesty the king of this part of the country. We found him seated in state, dressed up in motley garb of European manufacture, a white shirt with collar turned down, a crimson velvet loin cloth fringed with gold, tied round the waist by means of a belt; a beautifully mounted sheath-knife was stuck in his belt, the handle of which was made of nickel silver, being very showily ornamented with imitation emeralds and ruby garnets. Over all his dress was a beadle's red cloak, and on his head a helmet something resembling those worn by English Life Guardsmen; but it was evidently of French manufacture. The king was very young, apparently not more than twenty years of age, and very shy. When the strangers were seated, one on a chair, and the other two on a covered table, the rest of the courtiers sat down on the ground at a respectful distance both from the strangers and the throne. The king's old father was also there, on the ground before his son. The king's name was Sudikil, and that of his father, Mavonga. After the interview, Sudikil received his presents, with which he expressed dissatisfaction, and would give us nothing to eat, consequently Captain Perry, with Dean and M. Pisseaux, at once started for the river to return to Embomma. The consul engaged Nchama, a native who spoke African idiomatic Portuguese, to act as interpreter and go-between. Our party when it first started from the river, consisted of fifty-six persons, but as soon as we arrived at Kindemba it began to augment, and on our arrival at Kayé it had reached to 150. We were domiciled in the house of Chico Mpambo, a man who put himself up as a French interpreter, but who really knew nothing whatever of that language.

Early next morning we received a visit from Gidi Mavonga and his son Sudikil, who examined all our travelling gear. After half an hour's palaver everything was handed over to Gidi, who promised to start for the Congo in three days, and in consideration of receiving the said goods, bound himself to take us there, bring us back, and feed us by the way. This arrangement was very good, as it secured the friendship of the old chief, besides preventing him and his people from robbing or poisoning us. This day we received a visit from Tetu Mayella, king of an adjacent village, called Neprat. He was accompanied by about twenty followers, all of whom came to us for the express purpose of getting some rum. After a deal of wrangling, Tetu and party received a bottle of gin, for which he presented us with two fowls. This was a godsend, as the day before we had nothing to eat but a few pieces of dry bread. About the same time a pig was brought and slaughtered with great ceremony. Final arrangements were at last made with Gidi to proceed first to Yellalla, or the Congo cataracts, and afterwards to St. Salvador, or Great Congo City. The direction of the Yellalla cataracts from the village of Kayé is E.N.E., and that of St. Salvador, or Congo, E.S.E.

About noon next day (Thursday, September 10th,) we commenced packing in order to start for Gidi Mavonga's village. The natives of Congo are divided into two classes only, the Mfumo, or freeman, and the Muleque, or slave. The Mfumo marries amongst his own slaves, or, properly speaking, retainers, and the children born to him are in their turn Mfumos, or free men. The word slave is here quite improperly used, for the slave is, in reality, a freer man than the prince himself. Everything the prince possesses, except his wives, is literally at the disposal of the slave. Unquestionably, the slave is the body-guard of the Mfumo, but as regards work he does what he likes, sleeps when he chooses, attends to his own private affairs whenever he pleases, and if his master finds fault with his conduct, the chances are, if his own country is not too far away from the place of his thraldrom, he will leave him and make an effort to reach the place that gave him birth.

Gidi Mavonga came next morning to take us to his village, which we reached in half an hour. The only object of interest passed on the way was a palm-tree which the lightning had struck, killing it and tearing up several feet of ground. This was the first time we remember seeing any mischief done by lightning in West Africa. Gidi appeared to be a great worshipper of the native fetish. Mavunga is a conse-

crated country pot, and is placed in a small hut at the entrance to the town, and is supposed to be the presiding genius or patron saint of the place in which it is worshipped. Ibamba or Mzamba is a representation of Diabolus. The natives call him Masjinga, and is a house god, usually keeping guard at the bedside. The one in Gidi's house was a peculiarly droll looking object, about 3 feet in height, with mouth wide open, his under lip hanging down, the upper lip drawn up as if by some strong convulsion, nose flat, and the nostrils very much inflated. His eyes were composed of pieces of looking glass, and a piece was also inserted in his belly, but for what purpose we could not find out. On his head was an English billy-cock hat, and round about his shoulders hung different kinds of medicines, a calabash, and a kind of knife. The face of this wonderful figure was black, red, and white.

About mid-day we were visited by some neighbouring chiefs, all gaily attired as usual. They wore common red night caps on their heads, and this was the only head-dress we ever saw adopted by the men on great occasions, Sudikil's military helmet excepted. The women always go bareheaded. We have often wondered where in the wide universe the whole of our old clothes go to after they are purchased by the Jews in the streets of London. The mystery is solved without much difficulty, for we found kings wearing old second-hand livery vests, with the coronet and crest of a marquis on the button; and princes sporting their figures dressed in old livery coats and marines' jackets of the last century; besides a variety of heterogeneous habiliments, such as old superfine black coats which had been worn threadbare, and pantaloons the seats of which had become quite glazed from long service. All these had been cleaned and turned inside out by the Jews; and although some of the textures would scarcely bear the tug of a common needle and thread, they are all sent out to the West Coast of Africa as bran new garments, love of dress entirely blinding the natives from observing the various defects. After regaling our visitors with palm-wine and a bottle of gin, they went away.

The chief Furano, who was expected from Embomma, arrived next morning (Saturday, September 12th), and we at once started for the Cataracts. After marching for a short time, and passing two or three small villages, we commenced a rapid descent in a N.N.E. direction, and journeying at a rapid pace for about 3 miles we entered the village of Chinsawu, the residence of Prince Nelongo. On arriving at Nelongo's we had to wait half an hour in the verandah of an empty house before we were honoured by the presence of his highness, who intimated his pleasure of seeing us by asserting that unless the same presents were given to him as we gave to Sudikil, it would be impossible for us to pass his place. This was too preposterous, for we only stopped here to breakfast, whereas we were four or five days in the territory of Sudikil. At 11.15 my master arranged some botanical specimens which he had collected on the road, and I cut the letter B. and 1863 on the trunk of a large Adansonia or baobab-tree in this village.

We got comfortably housed at Nelongo's village, where we noticed, as we did in other places on the banks and neighbourhood of the Congo, that the children were all afraid of the white man; for when anyone attempted to bring them close to the Consul, the little brats howled as if Ajax from the infernal regions had got hold of them.

The whole of the next morning (Sunday) was taken up satisfying Nelongo, the native idea of the quantity of goods possessed by the white man being quite fabulous. At noon we again made a start, the sun being very hot, the thermometer standing at 90° in the shade. We made a slight descent into a valley, and then ascended a peculiarly formed hill, from the summit of which we obtained a glorious view of the river, which was seen some 800 feet below us, flowing down rapidly and majestically to the sea; but the utter barrenness of the country in the vicinity of its banks carried away every association of fertility from the mind of the lover of a commixture of all the elements which constitute the four seasons. This view of the country, however, is given at the end of the dry season, when almost every tree is leafless, and the grass is withered.

From this point commenced a decline down hill which baffles description. We had walked on and lost sight of the river, and the second time we sighted it we had not journeyed above a quarter of a mile before we arrived at a part of our road where, without exaggeration, the path, if such it could be called, was only two degrees from the perpendicular, and as slippery as ice, owing to the quantity of loose stones and dry grass that lay everywhere.

The distance from Nelongo to the banks of the river is about 5 miles, and on reaching the waterside we found ourselves exactly at the junction of the Nomposo with the Congo River. The Nomposo, we were informed, extends all the way to St. Salvador, but is not navigable even for canoes. There were some fishermen following their vocation at the mouth of this small river, whose services we brought into requisition to take us across and land us a little above its mouth, but on the banks of the great river. There are two rocky islands in the river, on both of which are some tall green shrubs. On the opposite bank is the Banza Vivi, the best place on the river for any one to land wishing to see the Cataracts of the Banza Nculu. This is generally about the period when the light or dry season rains commence, and which usually last about six weeks or two months, and are a great boon to the natives, who depend on corn for subsistence. Maize or Indian corn can be grown in about forty days. An intelligent farmer, who can command sufficient water, will easily grow three crops a year. Cotton comes to perfection in four months, rice ditto, and cabbages between three and four months; casada—good for starch or arrowroot—from six to nine months; plantains and bananas, once a year; radishes, three weeks to a month; turnips in two months, and lettuces, endive, and carrots, from three to four months. The cultivation of peas is not only a loss of time, but a waste of ground, for they never bear enough in two rows, 12 feet by 4, to make a good plateful.

It is always advisable, in travelling through Africa, to keep guides and interpreters from knowing what you are really possessed of, for they are sure to make some excuse or other to fleece you. This morning (Monday, Sept. 14th,) we had evidence of the foregoing. We had paid our guide everything that was requisite for the road, yet, notwithstanding this, he sent the interpreter to ask us for a piece of fancy cloth, which they knew we had in our possession.

You must grant their request, otherwise you may have to give up your journey, for, ten chances to one, they will leave you. Having crossed the river we waited for Gidi and a few hands that had been left behind. On their arrival we started for Vivi, and reached the village after half-an-hour's march.

The king of Vivi, Nesalla by name, spoke Portuguese, and sent us three bunches of plantains and seven fowls for the expedition. In the afternoon Nesalla came with upwards of one hundred armed men, and commenced a long palaver about our going on to Yellalla. Five or six persons spoke, and the conference lasted an hour. The result was that the cloth we had with us was not enough, and that the princes at Yellalla must get a different piece from that which was before the conference, and no division into two pieces was to be made of it under any consideration whatever. As the whole affair was conducted in a good-humoured manner my master agreed to the terms. In the evening the inhabitants of the village had a dance, which ended in drunkenness and uproar.

Banza Vivi, like all other parts of the country, is entirely free from bush. The inference to be drawn from this fact is that the whole country, at no very remote period, must have been under cultivation. In trade the natives always give full measure; and in filling a jug with palm wine it is always done to overflowing. A circumstance illustrative of this took place whilst we were staying at Senhor Pereira's at Embomma. A bag of ground-nuts was being measured, and the vendor finding that the measure did not overflow, at once ran to the market, and returned with the requisite quantity to make up the quantum.

Early next morning (Tuesday, September the 15th) we started for the Banza Nculu. The scenery along the road was varied and picturesque. The first view we had of the river was from an eminence about a mile from Vivi. Here we had a view of the Congo as it was flowing onwards, and round about in all directions were hills and dales of various sizes, adding a panoramic beauty to the scene, far beyond the conception of an artist's pencil. We had to descend from the summit of this hill, and ascend a second one much higher, from which we again obtained views of the Congo. One, the lower view, appeared like a lake apparently shut in on all sides by hills, the lofty summits of which, stretching far and wide on every side, and some of them peering to the height of above 1000 feet into the heavens, gave the place the appearance of Dr. Johnson's ideal Happy Valley of Rasselas. Proceeding onwards, we ascended a third eminence, but by this time we had entirely lost sight of the river, and our path became more level for a short distance. Stopping to gather some flowers, I lost sight of the last of the carriers, and it was some time before I found them. On entering a small village I espied them surrounded by natives—men, women, and children, all of whom appeared to be highly delighted at the sight of the white men.

We now commenced a gradual descent, but before doing so we obtained an open and extensive view of the valley that lay between us and the Banza Nculu. On descending into the valley, we found the soil a dark clay mould, with fewer stones than that of the country through which we had hitherto passed. It was certainly a fine sight to behold, and the best addition to the scene was the caravan forming the expedition, now disappearing down a valley, now rising to the top of one of the many hillocks with which the valley abounds. The fertility of the soil may be observed here from the fact of the grass growing to the height of 10 or 12 feet. And here, also, the native beans grow to a greater height than those met with in other parts of the country. In the valley we crossed three streams—all feeders of the big river—and, considering it was the close of the dry season, these streams had a fair supply of water.

We now arrived at the summit of the Banza Nculu Hill, where we had to wait the pleasure of the three kings, who with their interpreters were settling some business. So we had to bivouac under a large tree until their highnesses condescended to grant us an audience. Bearing due south from this tree, and on the left bank of the river, is Palabala, one of the many ways by which a traveller may reach Sundi, above the Congo Rapids, where the river is said to become deep, broad, and navigable.

About two o'clock one of the interpreters was sent to put us into a house. In an hour and a half's time we heard the beating of drum and cone (an instrument similar to the triangle), and on looking out a procession was seen wending its way to our new lodgings. The three ministers of the kings were the principal personages, and had come as ambassadors from their master. After three conferences the moderate sum of 300*l.*, in cloth, beads, and liquor, was demanded, in order to continue our journey to Sundi, a distance of only three days' march.

Our object was to reach Sundi, and from thence try to ascertain the course of the river, and to find out whether its source could be reached by canoes or carriers, but finding the demands of the chiefs beyond our power of compliance, we at once resolved to return. Before doing so, however, we proceeded next day to view the Yellala Rapids, which run E.N.E. and W.S.W., and may be said to be about a mile in length. They are assuredly very grand, although the natives led us to expect something even grander. Some fishermen were busy catching fish up and down the quieter parts of the rapids, while the eagles and cranes were satisfying their hunger in the vicinity of the island of Sanga-Cha-Malemba in the middle of the stream.

All day Gidi Mavonga was very stubborn and irritable, wishing to start at once for Vivi, and return home; but my master having to arrange some botanical specimens, to finish two sketches of this part of the country, and being foot-sore, would not hear of starting.

September the 19th found us again at Gidi's village, paying off all the extra hands who had accompanied us to the rapids; and on the 24th we were once more at Embomma, arriving at Porto da Lenha on the 26th. Next day at 4.15 A.M., we arrived at Point Banana, and at 6 o'clock all our things were landed and comfortably housed in M. Parrat's factory.

SELIM AGHA.

BEKE TESTIMONIAL FUND.—A fund is being collected for the benefit of Mrs. Beke, who for sixteen years assisted her husband, the late Dr. Beke, in his numerous labours for the cause of commerce and civilization, and, let us add, geography. The Committee is formed of men of influence, and we trust its appeal will be liberally responded to. Contributions should be paid to Messrs. Roberts, Lubbock & Co., Lombard Street.

ZANZIBAR.

THE presence in London of the Seyyid Barghash of Zanzibar sufficiently accounts for the map of his dominions which accompanies this number of the *Geographical Magazine*. This map is naturally imperfect, because our knowledge, even of the coast, leaves much to be desired, but, nevertheless, furnishes some information not readily accessible through ordinary atlases, and enables our readers to form an idea of the extent of the territories governed by their guest.

The dominions of the Seyyid of Zanzibar extend from the small coral island of Warsheikh, in latitude 2° 30′ N., to the village of Tungue, to the south of Cape Delgado, where they join those of Portugal. All the islands along this coast, a few small ones excepted, are held by him, but on the mainland his dominion scarcely extends beyond the walls of the towns garrisoned by Arab troops, and many parts of the coast, especially in the Galla and Somali countries, defy his authority altogether. Recently small garrisons have been advanced far into the interior, to Unyanyembe and Urori, but these, we believe, have lately been withdrawn. Even on Zanzibar Island the rule of the Seyyid is much curtailed by the influence of powerful Arab families, who look upon him merely as the first amongst equals. His authority is absolute only with reference to the non-Arab population not placed under the protection of some European consul. On the mainland he generally shares his sovereignty with the old Suaheli chiefs, who take a share of the customs' receipts, and exercise the authority generally associated with government. The coast tribes, though they may own allegiance to the Seyyid, nevertheless pay tribute only to some negro potentate, who is close at hand, and better able to protect or punish them. This precarious position of the Seyyid, with reference to a large portion of the territory nominally under his sway, sufficiently explains the difficulties with which he will have to contend in order effectually to suppress the slave trade.

Our knowledge of the population and area of the Seyyid's dominions is exceedingly scanty. The three large islands, Zanzibar, Pemba and Mafia, have an area of 630, 227, and 200 square miles respectively, and the population of the former is variously estimated between 100,000 and 380,000 souls.

The country is capable of supplying all kinds of tropical produce, including cloves, sugar, cocoa, coffee, nutmegs, cinnamon, guinea pepper, sesame, indigo, cotton, copal, and ivory, but comparatively little has been done hitherto to develop its resources, for the slave trade almost entirely monopolized the energies of the trading classes. The treaty signed on the 20th June, 1873, not only abolished the export of slaves to countries but that from the mainland to the foreign islands likewise. It will compel the merchants to seek other investments for their capital, and is almost certain to lead to the establishment of plantations, like that near Kokotoni, which is managed with remarkable success by Captain Fraser, and with the aid of free labour only. Amongst the rivers there are several which might be used as commercial highways. The Juba, though closed by a bar, is navigable for small craft for a considerable distance. The Wami, opposite Zanzibar, is likewise available for purposes of navigation, as is also the Kingani further south; but the most important of all will probably be the Lufiji or Rufiji. This river was first explored by Dr. Roscher (1859), who embarked on the Kikunia Creek, proceeded up the Rufiji as far as Niambara, and then descended the Jaja branch to its mouth. In 1872 Captain Wharton and Dr. Kirk ascended the Simba Oranga mouth as far as Fugulia, and returned through the Bemba branch. At the furthest point reached by them, 20 miles above its mouth, the river was 150 yards wide and 6 feet deep, and this was in the dry season. Dr. Kirk is of opinion that a steam launch might ascend for a very long way up in July, before the water has fallen. Captain Elton and Lieutenant Pullen, who crossed the river of Mpenbeno, about 10 miles beyond Dr. Kirk's furthest, found the river 260 yards wide, with a current running about two knots an hour, and averaging 3½, 4, and 5 feet in depth from bank to bank at the driest season of the year. Mr. Stanley who ascended the river subsequently, apparently as far as Mpenbeno, confirms these statements with respect to the Rufiji being navigable. The Ruvuma further south, is likewise navigable for a considerable distance as proved by Dr. Kirk's ascent of it.

It is difficult to form an estimate of the trade carried on, as the custom-house returns are very fallacious guides. British India in 1872-3 imported merchandise to the value of 198,516*l.* from Eastern Africa, and exported thither Indian and foreign produce valued at 329,930*l.* From Mombasa there were exported in 1872, to Zanzibar and Bombay, ivory, gum copal, and minor articles to the value of 18,930*l.* The imports amounted to 32,660*l.* A more just conception of the trade may be gathered from the fact that one Indian firm, whose affairs became the subject of judicial investigation, had 434,000*l.* invested in loans and mortgages in Eastern Africa, and Dr. Kirk estimates the Indian capital invested in Zanzibar Island alone at 1,600,000*l.* There is scarcely an estate there, which is not heavily mortgaged to some Indian trader, but a large share of the capital was employed hitherto in fostering the slave trade.

The direct trade between England and Zanzibar has always been inconsiderable, but a large quantity of English goods have found their way thither through the hands of the Banians, who monopolise almost entirely the whole of the trade. Of late years, since the suppression of piracy and the extinction of the Company's monopoly, Indian trade has been restored to something approaching its former importance, and a passage from Eastern Africa to India, which was looked upon formerly as a hazardous enterprise, the success of which was celebrated by public rejoicings, has now become an event of every day occurrence. The number of Indians in Eastern Africa is now steadily on the increase. In 1870 Dr. Kirk estimated their number in the Zanzibar dominions at 3710, but Sir Bartle Frere is of opinion that their aggregate number is much greater, and as few of them have families, they represent in fact a commercial community equal to that of a very considerable town.

Amongst these Indians the Bhattias are probably the most important by wealth and influence, and together with the Banians proper they form the Hindu community on Zanzibar Island. The Muhammadan trading element is represented by Khojas, Mehmons, and Bohras. All foreign trade passes through the hands of these Indian traders, who collect the African produce for the European and American export houses,

Mayila Mission Station, Lat 3° 5' 6"

Geog.r. Magazine, 1875.

THE SOMALI COAST.

Same Scale as large Map.

THE DOMINIONS OF THE SEYYID BARGHASH BIN SAID OF

ZANZIBAR.

By E. G. Ravenstein.

Scale: 1:3430.000

0 10 20 30 40 50 60 70 80 90 100 Stat. Miles

Zanzibar Dominions.

More or less amenable to the Seyyid's authority.

and distribute the goods imported by these latter to the natives. Nearly every shopkeeper along the whole of this coast is an Indian. Arriving with little beyond credentials to his fellow countrymen, he soon starts a shop of his own, and after a few years, when he has made a little money, generally returns home to marry, and then comes back to Africa, to repeat, on a larger scale, the same process of money making. Most of them are like birds of passage, and though there are some old-established houses, they are generally represented by men of recent standing.

The Indian trader generally confines himself to the coast, and leaves the Arab, the half-breeds and Suaheli or coastmen, to push into the interior of the country, in search of markets. The journeys of these Muhammadan dealers are sometimes of great extent, and there are cases on record of their having reached Angola, on the West Coast of Africa.

The abolition of the slave trade must naturally work a change in the commercial relations of these countries, and although inseparable from individual hardships, will eventually result to their benefit.*

Reviews.

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JAGOR'S PHILIPPINES.†

WE welcome this book as an accession of unquestionable value to the scanty literature of the islands to which it refers. In these days when the reading public finds it hard to keep abreast of the flood of travel books with which it is deluged, it is refreshing to meet one so full of thought as Herr Jagor's work. Although his personal experiences of the country date from fifteen years ago, we cannot regret that their publication has been delayed, for it has afforded him opportunities, of which he has industriously availed himself, of ransacking the archives of the Spanish Colonial Office, and perusing such older works on the Philippines as were to be found in the libraries of Berlin and London.

The Archipelago of the Philippines numbers thirty-one islands of importance, exclusive of numerous tiny islets, rocks, and reefs. They extend from north to south over sixteen degrees of latitude, a circumstance which endows them with a striking variety of climate, which in its turn is exemplified in the growth of products belonging to both the temperate and torrid zones, the palm and the fir, the pine-apple, the potato, and wheat flourishing alike on their shores. The situation of these fertile islands, occupying as they do a central point between Japan, China, Annam, the English and Dutch settlements in the East Indies and Australia, not to speak of their favourable position for communication with the west coast of America, ought to ensure them a world-wide trade. But hitherto, in spite of the early trade with Manilla in the 16th century, commerce has languished hopelessly through the elaborate and short-sighted restrictions imposed by Spanish protectionists. There is, however, good ground for anticipating better days, for a decree of the 5th of April 1869, provided that the differential duties, which were framed in a spirit of the most extraordinary hostility to all foreign traders, should expire at the end of two years, that all export duties should be abrogated, and that the more annoying port dues should be consolidated into one single charge.

One remarkable peculiarity of this colony is the fact that the Spanish conquerors appear to have taken root in a manner which may be looked for in vain in countries colonized by the Dutch or English. Dr. Jagor quotes a pertinent remark of Bertillon's that the capacity of the Spaniard for acclimatization in tropical countries may be ascribed to the large admixture of Syrian and African blood, which the migrations of the ancient Iberians from Chaldæa across Africa, the colonies of the Phœnicians and Carthaginians in the peninsula, and the invasion of the Moors, successively occasioned. A characteristic want of originality in the native mind causes them to draw the bonds of union closer by their servile imitation of Spanish manners and customs. Nevertheless, the native respect for the superior race is much diminished by the *vaut-riens* which the mother country throws on the hands of her daughter, and who have the bad taste to look down upon the creoles as an inferior caste.

Spanish maladministration is not so novel a subject that anyone should be surprised at an *exposé* of its results in the Philippines. Dr. Jagor observes that in England the higher colonial offices are filled only by those who have given proofs of fitness and ability, but that when a Spaniard succeeds in getting an appointment it is difficult to say whether it is due to merit or to intrigue. After taking into account, however, the fertile crop of troubles brought upon the Indian Government by a certain Presidential Governor, we must supplement Dr. Jagor's dictum with the remark that with England, as with Spain, an official of doubtful capacity is occasionally allowed to cling to office. Still the Spanish Colonial policy is marked by some inexplicable blots. The term of office of their officials is, for fear of their acquiring influence, limited to three years, and this, combined with an excessive red-tapeism, militates against the possibility of instituting many reforms, for, just as the alcaldes are beginning to appreciate the capabilities and requirements of a district, they are obliged to leave it.

The most important products of the islands are tobacco, coffee, cacao, cocoa-nut oil, sugar and Manilla hemp. The most notable fact in connection with these is the monopoly of tobacco. The Government appropriated the fields of the peasants without the slightest indemnification—fields which had been brought under cultivation for their necessary means of sustenance—and forced them to raise on the confiscated property an article which required an immense amount of trouble and attention, and which yielded a very uncertain crop; they then valued the harvested leaves arbitrarily and without any appeal, and in some favoured cases paid for them; but this has now apparently not been done for several years in succession, and Spain regularly remains indebted to the poor

* In writing this article we have largely drawn upon *Correspondence respecting Sir Bartle Frere's Mission to the East Coast of Africa*, 1872-73, one of the few really interesting blue books issued within the last few years. Those amongst our readers desirous of obtaining further information respecting Zanzibar, may be referred to Captain Burton's *Zanzibar*, and to the account of Baron von Decken's Expedition.

† *Travels in the Philippines.* By F. Jagor. London (Chapman & Hall). 1875.

peasants in the amount of the miserable pittance from one year's end to another. In addition to this, the Government even rewarded informers, who, after pointing out fields which were already owned but, apparently suitable to the cultivation of tobacco, were actually installed into possession of the proclaimed lands in place of the original owners! It cannot be wondered at, that in the opinion of competent judges the tobacco should, by oppressing the wretched population, seriously interfere with the prosperity of the colony, and yet we learn with surprise that the Government proposes to arrange for extracting a still larger gain from this impolitic source of revenue.

The proximity of the Philippines to the possessions of Russia and America, renders it probable that their future commercial relations will be of an important and extended nature, but Dr. Jagor points out that in the interests of the natives, it is desirable this should not soon become an accomplished fact, because their education and training have not yet fitted them to compete successfully with either of the other two energetic creative and progressive nations.

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JOURNEY ACROSS THE WESTERN INTERIOR OF AUSTRALIA. By *Colonel Peter Egerton Warburton, C. M. G.* 8vo., pp. 308. Map. London (Sampson Low & Co.)

COLONEL EGERTON WARBURTON has missed a splendid opportunity! The adventures through which he passed in the course of his plucky journey across the Australian continent would have furnished other writers with materials for a stirring book of travels and an interesting account of the country. The author of the book before us has thrown away this chance of writing a permanently popular volume, he has disdained even to describe his journey to the Alice Springs, which occupied three months, and hardly says a word about the enthusiastic reception accorded him on his return to civilized life. He is content to print a diary, which he kept during his adventurous journey through the desert, and although this diary is written in the most unpretending style, it will nevertheless be read with interest by thousands, for it records success due to unswerving perseverance. To geographers, as a matter of course, it is altogether indispensable. The introduction on the history of exploration in Australia, by Mr. Ch. H. Eden, is well and carefully written, and the editorship of Mr. W. H. Bates sufficiently guarantees the trustworthiness of the facts stated.

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VESTIGES OF THE MOLTEN GLOBE. By *W. L. Green*, (Minister of Foreign Affairs to the King of the Sandwich Islands. Part I. London (E. Stanford), 1875.

IN 1857 the author of this volume published in the *Edinburgh New Philosophical Journal* certain views with respect to the form of the continents, the figure of the earth, and the nature of volcanic action. These views, which, we feel bound to say, are strictly original, he has since developed, and in the volume now before us the figure of the earth is treated of. The author assumes that the solid crust of our earth forms a six-faced tetrahedron with curved faces. The earth's axis of rotation passes through one of the obtuse solid angles of this crystal and through the acute solid angle opposite, the former representing the north pole, the latter the south pole. He then assumes that this solid mass is enveloped by the ocean, which in obedience to the centrifugal force of rotation, adopts a spheroidal shape. This ocean covers about three-fourths of the surface of the crystal, the three acute solid angles, which rise above its surface, representing the four continents or quarters of the globe, viz., Europe-Africa, America, Asia-Australia, and the Antarctic continent, whilst the four obtuse solid angles are covered by the four oceans. These views are fully illustrated by diagrams, but we need hardly say that their author has not succeeded in convincing us of their truth. The addition of a cardboard projection of the six-faced tetrahedron, with a map of the globe printed upon it, which could easily be cut out and glued together, would very much facilitate a comprehension of the theories submitted to us by the author.

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ANNUAL RECORD OF SCIENCE AND INDUSTRY FOR 1874. Edited by *Spencer F. Baird.* London (Trübner & Co.), 1875.

THIS work is a very praiseworthy effort to combine in one volume a *résumé* of the chief events during last year in the multifarious branches of science and industry. The idea of such a work is young, having been started in 1871, and it is obvious that the compilation is so big a task that to attain anywhere near completeness in the results would be almost an impossibility. Nevertheless our readers will be surprised to see how much the book does contain; mathematics and astronomy, terrestrial physics and meteorology, physics, geology, geography, and natural history, agriculture and rural economy, domestic economy, mechanics and materia medica, all these subjects have been ransacked to supply facts, and in most cases a reference to the fuller reports is subjoined. Herein constitutes the highest value of the present work, and we trust that the editor and his able staff may be encouraged to persevere in their task, and perfect future issues of so comprehensive and useful a publication.

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DIE DEUTSCHE EXPEDITION AN DER LOANGO-KÜSTE, NEBST ÄLTEREN NACHRICHTEN ÜBER DIE ZU ERFORSCHENDEN LÄNDER. Von *A. Bastian.* 2 vols. 8vo., pp. 750. Jena (Costenoble), 1875. London (Trübner & Co.)

THE origin of the German West African Expedition and the favourable circumstances under which it is able to carry on its labours, are almost wholly the result of Dr. Bastian's persistent advocacy and active support. He had himself visited the Congo coast and San Salvador in 1857, and was therefore enabled to give sound advice with respect to outfit and the selection of the most suitable route for penetrating into the interior. So lively was the interest he took in the success of this enterprise that in 1873 he went himself to the coast of Western Africa, and only started on his return, after a suitable coast station had been fixed upon as a base of supplies, and everything calculated to ensure success had been provided. During this visit Dr. Bastian ascended the Congo River as far as Bomma, explored the coast of Loango to the river Quillo, and made several excursions into the interior of the country. The results of these explorations are now before us, and they will be welcomed all the more as the Loango coast has hitherto been almost a sealed book to us. In addition to a narrative of travels, the author presents us with a topographical description of the coast, an account of the inhabitants, and of the political condition of the country, with linguistic studies and a vast mass of information collected by him with respect to the interior of Southern Africa. Dr. Bastian's book is not only exceedingly instructive, but also highly interesting. His knowledge of various parts of the world, and extensive reading, stand him in good stead when describing the customs of the west African negroes. The introduction of analogous

cases from all quarters of the world, however, leaves rather a hazy expression upon our mind after reading some of his chapters, except it be a confirmation of a conviction that all men are kin, and their manners and customs merely the outcome of the same human nature developing itself under varying conditions.

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NACH DEN VICTORIAFAELLEN DES ZAMBESI. Von *Eduard Mohr*. 2 vols. 8vo. pp. 544. Illustrations. Leipzig (Hirt), 1875.

MR. MOHR has written one of the most attractive books of travel lately issued from the German press. His wanderings certainly have not extended into unknown regions, never before trod by the foot of European, but unlike most of his predecessors, he possesses the gift of calling up in our mind a vivid picture of the scenery through which he passed, and of the people with whom he came into contact. He keeps alive our interest from the moment he sets foot upon one of the German Lloyd's steamers at Bremen until his departure from Africa, and whether in the civilized towns of Natal, in the hunting-grounds first rendered famous by Gordon Cumming, on the farmstead of the stolid boor, in the camp of the gold miner on the Tati, or amongst the native Kafirs and Bechuanas, he proves himself equally a pleasant and instructive companion. It was the love of adventure which primarily led Mr. Mohr to the wilds of Southern Africa, but for all that he has rendered good service to science, by determining in a careful manner the geographical position of a large number of places between the coast and the Victoria Falls on the Zambesi. These positions, and especially his longitudes, have proved of the greatest service in the construction of our maps. And further service to science was rendered by Mr. Mohr by taking with him as a travelling companion a competent geologist, Dr. Hübner. The latter has contributed to this volume a description of the South African diamond fields. The work is well illustrated, and printed in Roman type on good stout paper.

Cartography.

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The Ordnance Survey in 1874.

THE "Report of the progress of the Ordnance Survey to the 31st December, 1874," has just been published by Lieutenant-General Sir Henry James, and bears ample testimony to the satisfactory progress of our great national survey. The work of the 20 officers, 372 non-commissioned officers and men, and 1448 civil-assistants, may appropriately be divided into two sections, viz., that of the survey proper, and that of publication, and in order to obtain a correct idea of the progress actually made, it will be as well to consider each of these sections separately.

Our readers are aware that the survey is carried on now on a scale of 1:2500 (a square inch to the acre), for all the cultivated districts in Great Britain, and of 6 inches to the mile for two uncultivated parts of the country. The whole of Scotland, with the exception of the Orkneys and Shetlands and portions of the western islands has now been surveyed. In England the new survey extends over the six northern counties, Cheshire, Denbigh, Flint, Essex, Kent, Middlesex, Surrey, Sussex, Hampshire, the Isle of Man, and considerable portions of other counties. At the present moment the mineral districts are in progress of being surveyed, and this accounts for the apparent want of order in the conduct of the work, which is still further interfered with by occasional requisitions of the War Office and of certain municipal councils, who, like that of Exeter, are anxious to have their cities surveyed out of the ordinary course, a desire generally gratified on condition of the council undertaking to pay two-thirds of the cost of the survey. The work in Scotland made less progress during last year than was expected, owing to the amount of rain which fell during the autumn, and which, in the Isle of Skye was 50 per cent. in excess of that of ordinary years. The survey of Ireland on the 6-inch scale was completed some years ago, and is now being revised.

The progress of the surveys during the last three years, and their present state, is shown in the tabular statement which follows:—

		England and Wales. (Including Isle of Man).	Scotland.
Surveyed in	1872	1666 sq. m.	1561 sq. m.
,, ...	1873	1745 ,,	2118 ,,
,, ...	1874	1456 ,,	1029 ,,
Total up to close of	1874	26,358 ,,	28,858 ,,
Remain to be surveyed		24,802 ,,	1837* ,,

This rate of progress, we feel bound to say, is perfectly satisfactory, bearing in mind the accuracy and care with which the survey is conducted. It will enable the present staff to complete their labours in the course of another ten slow years, not a very long space of time, if we look to the progress made in other countries.

In addition to the above surveys, plans have been made of the following towns, viz., Abingdon, Altrincham, Birkenhead, Chester, Cirencester, Crewe, Eastbourne, Harwich, Merthy-Tydfil, Owestry, Runcorn and Slough in England; Clonmell and Mullingar in Ireland. The survey of the Scottish towns is completed. In Ireland, where this magnificent national survey is actually used for cadastral and administrative purposes, maps of 246 estates (area 217,228 acres) were made for the Landed Estates Court, 122 glebes (6610 acres) were surveyed for the Irish Church Temporalities Commissioners, and the tenement boundaries were inserted on 417 sheets of the 6-inch map for the Valuation Department. The hills were sketched in the county of Sligo and partially in that of Queenstown.

We now turn to the progress of publication which, we are sorry to say, does not keep pace with that of the survey, as can be seen from the following tabular statement:—

		England and Wales. 1:2500 sq. m.	England and Wales. 6-in. map. sq. m.	Scotland. 1:2500 sq. m.	Scotland. 6-in. map. sq. m.
Published in .	1872	970	705	653	1153
,,	1873	838	411	518	1154
,,	1874	926	418	296	1610
Total published to close of 1874		11,529	16,678	10,908	19,850

Taking the progress made during these three years as our guide, no less than twenty-five years must pass before 6-inch maps for the whole of Great Britain shall have been published, and as the survey will be com-

* These figures differ somewhat from those given in the Report, for Sir Henry James assumes the area of England and Wales (including the Isle of Man) at 58,000 square miles, and that of Scotland at 30,000. According to the Census Returns the area of England and Wales is 50,932 square miles, that of the Isle of Man 227 square miles. The area of Scotland, according to Sir Henry's own figures for the counties, but minus the Orkneys and Shetlands, amounts to 29,760 square miles. The area of the latter is stated, in the Census, to amount to 935 square miles, and the total area for Scotland therefore is 30,695 square miles.

There are other discrepancies in Sir Henry's figures, which we are unable to elucidate. In the Report for 1872 the total area surveyed in England and Wales is stated to amount to 22,693 square miles. If we add to these the area surveyed in 1873 and 1874, as given above, we obtain 25,904 square miles as actually surveyed, instead of the 26,358 given in the Report for 1874, a difference of no less than 454 square miles. On the other hand, the surveyed area of Scotland should amount now to 28,977 square miles. The Reports, which are not by any means conspicuous for a lucid arrangement of facts, afford no clue to these discrepancies.

pleted in the course of ten years, most of these map will become obsolete before they reach the hands of the public. We are fully able to appreciate the beautiful style in which these maps are being engraved, but are of opinion that this beauty is purchased at too high a price if it causes such unreasonable delay in the publication of the maps. We hear such a deal about photo-zincography and its application to cartographical work of all kinds. Surely, here is an opportunity of utilizing it on a large scale. It is sheer waste of public money to engrave maps on so large a scale on copper, especially as only a few copies of each are required. They would be equally serviceable if produced in photo-zincography, or better still, in photo-lithography, from a carefully drawn original, which could be revised from time to time as new editions are required. The maps would lose somewhat in appearance, but this loss would be more than compensated for by their speedier publication.

Even more provoking is the slow publication of the 1-inch map, which after all, is the one most useful to the general public. The new survey of England and Wales is in a sufficiently advanced state to have rendered possible the publication of 130 sheets of the 1-inch map, of which only 73 have now been published. One of the maps appended to the Report certainly shows 14 more sheets as having been engraved in outline and with names, but they are withheld from the public for some unaccountable reason, and neither figure in the catalogue, nor are they to be procured from the agents charged with the sale of the maps. The case is almost worse with respect to Scotland. According to the Report 78 sheets of the map have been engraved in outline and with names, and there are surveys for 20 more. Yet, up to the beginning of the present year only 55 of these sheets have been issued to the public, whilst 23, though ready to go to press, are withheld. Surely, this cannot be done in order to push the sale of the Parish and 6-inch maps.

In addition to the above there were published in the course of last year, 54 sheets of the 5-feet map of London, and 7 of that on a scale of 1:2500, and plans (on the 10-feet scale) of Andover, Barrow-in-Furness, Brentwood, Canterbury, Hyde, Lewes, Margate, Petworth, Rye, Wick, Athy, Celbridge, Kildare, Maynooth, and Newbridge. A work on the processes and methods adopted for the production of the ordnance maps is in the press, and as it has been prepared by officers acquainted with the detail of the work, it will no doubt prove of practical value.

The sales, in 1874, realized the paltry sum of 831*l.*, the pay of the persons employed upon the survey, amounted to 111,400*l.*, exclusive of the regimental pay of the Royal Engineers.

Reduced Ordnance Maps of Scotland.*

MR. BARTHOLOMEW of Edinburgh is doing good service to tourists by publishing a series of Scotch maps, actually reduced from the Ordnance Survey, and embodying nearly the whole of the information to be found on these latter. The maps of this set now before us are neatly engraved, and embrace some of the favourite tourists' districts. They are without hills, an omission which we regret, though the majority of tourists will probably prefer the maps as they are. Mr. Bartholomew is to be congratulated upon the able manner in which he popularises the results of the Ordnance Survey, and we have no doubt his topographical map of Scotland, when completed, will meet with the reward due to conscientious labour.

E. G. RAVENSTEIN.

* Reduced Ordnance Maps of Scotland. (1) Edinburgh district; (2) Glasgow and Clyde District; (3) Central Perthshire; Perth and Dundee District; (4) Loch Lomond and the Trossacks. By John Bartholomew, F.R.G.S. Scale 2 miles to an inch. Edinburgh (Black), 1875. 2s. 6d. each.

Log Book.

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Captain Allen Young's Arctic Trip.—Captain Allen Young left England on the 26th of June, on a private expedition to the Arctic Seas north of America in the 'Pandora,' a three-masted schooner of 439 tons burthen, with screw steam-engines of 80 nominal horse-power. He will probably follow the track of the 'Alert' and 'Discovery' as far as the Carey Islands, where he will leave letters for the expedition, and then endeavour to penetrate westward through Lancaster Sound. Whether he would follow after that his own former track when serving with Sir Leopold M'Clintock in the 'Fox,' or that of the 'Erebus' and 'Terror,' must depend on the state of the ice. Should the season prove a favourable one it is not impossible that Captain Young may be enabled to coast along the whole northern shore of North America, and emerge by Behring's Straits.

Recent Distinctions conferred on Arctic and other Officers.—We are glad to perceive that the services of Admiral Collinson have been rewarded with the dignity of K.C.B., and those of Captain R. V. Hamilton with that of C.B. Both these officers have done good work in Arctic latitudes. Admiral Collinson entered the navy in 1823. He served in the 'Wellesley' during the first China war, (1841), and was commander of the 'Plover' in piloting operations up the Yangtse River. For his distinguished services in China he was made a C.B. He was Captain of the 'Enterprise' in the Arctic Expedition, *viâ* Behring's Straits of 1850-55, and during this period he did much valuable exploring work both by navigation and sledging. He received the gold medal of the Royal Geographical Society in 1858 for his Arctic discoveries.

Captain R. V. Hamilton entered the navy in 1843; was mate of the 'Assistance' under Ommaney, in 1850-51; Lieutenant in the 'Resolute (Kellett) 1852-54, and in both expeditions accomplished much useful sledging work; he afterwards served in the Baltic and in China, and is now Captain Superintendent of Pembroke Dockyard.

Commodore Goodenough, whose valuable report on the Fiji Islands, has been referred to on pp. 85 and 116 of our March and April numbers respectively, has also received, we are glad to see, the twofold distinction of a C.B. and C.M.G.

Professor Nordenskjöld left Tromsö on the 8th of June on board the Norwegian yacht 'Proeven,' Captain Isaksen, an experienced Arctic navigator. Professor Nordenskjöld will proceed to Novaya Zemlya and make an effort to reach the mouth of the Ob or Yenisei, through the Kara Sea. He will then abandon the yacht, and continue his coasting voyage in a boat.

The Geographical Congress at Paris.—This Congress will be opened on the 1st of August, and promises to be a complete success, in as far, at least, as the exhibition of maps and other objects bearing upon geography, however remotely, is concerned. The requsal of the Government to appoint a Commissioner has excluded private firms from the exhibition; but there will be collections of maps and charts from the Admiralty, the Topographical Depart-

ment of the War Office, and the Indian Survey Office The Geographical Society will be represented by Sir R. Alcock, one of its vice-Presidents, and will exhibit a collection of its *journals*. Most foreign governments have appointed commissioners and commissions. Thus, Sweden will be represented by Colonel Versteek, Director of Topographical Surveys ; M. Stiffe, librarian at Upsala University ; Professor Forell, of the Geological Survey ; M. Sidenbald, of the Statistical Department ; and M. Ruberison, of the Meterological office. The Netherlands will be represented by Colonel Versteeg, Egypt by Dr. Sceweinfurth, &c. The business of the Congress will be transacted in sections, and the meetings are not to extend over ten days. The sections are (1) mathematical geography, geodesy a nd topography ; (2) hydrography and ocean geography ; (3) physical geography, meteorology, anthropology and geology ; (4) historical geography, ethnography and philology ; (5) economical geography and statistics ; (6) didactic geography ; (7) travels. The programme already contains no less than 123 questions to be discussed by these sections. A general meeting will be held daily, in the forenoon. Amongsi foreign geographers of note will attend the Congress are Professor H. Kiepert, Dr. O'Peschel, D. A. Petermann, Weyprecht and Payer, Dr. Nachtigall and Dr. Schweinfurth. The Paris Committee have made arrangements with several hotels for a reduction of their ordinary charges and every facility will be afforded to members to inspect the scientific collections and make excursions into the neighbourhood of Paris. Forms of application for membership can be obtained from the Secretary of the Royal Geographical Society or from Baron Reille, 10, Boulevard Latour-Maubourg.

India at the Paris Geographical Congress.—Colonel T. G. Montgomerie, R.E., F.R.S., the Deputy Superintendent of the Great Trigonometrical Survey, has been deputed by the Secretary of State for India to attend the approaching Paris Geographical Congress on behalf of the Indian Survey Departments. He will take with him a carefully assorted selection of the principal lithographed, photozincographed, and engraved maps of the Indian Surveys, and, besides probably taking a prominent part in the Congress itself, he will also be at hand to render explanation on any point concerning the maps under his care. In addition to his great practical knowledge in all the varied operations of the Survey, Colonel Montgomerie has thoroughly identified himself with the geography of the regions lying around the northern frontiers of India, and an exposition of his views on this interesting and important subject will be both authoritative and valuable.

Indian Marine Surveys.—A sketch of the organization, or rather *modus operandi*, for executing this important requirement, has just been drawn up for submission to the Government of India. Captain Taylor, the Superintendent, proposes to undertake coast surveys in the interests of commerce and navigation, the scale being decided on by the Superintendent according to the importance of the survey and the nature of the coast. Where possible the work will be based on the Great Trigonometrical Survey, and this will contribute to the completeness of both surveys. The original surveys of harbours, ports, river entrances, &c., will be photozincographed and issued for local navigation and engineering purposes. Being on large scales and sounded sectionally, they will be of great use for reclamation and improvement purposes and such like. From the plans and coast surveys would be compiled charts on a medium scale for general navigating purposes. Copies of all original surveys, except those required for local purposes, will be forwarded to the Admiralty Hydrographer for engraving as that officer may think fit, the Indian Superintendent at the same time furnishing his views for the information of the Admiralty Department. In the surveying operations science will be cared for. Endeavours will be made in the appointment of surgeons on board the vessels to secure the services of officers with scientific acquirements. Dredgings, meteorological observations, and observations on the temperature and currents of the ocean, will be made where opportunity offers ; and the desirability of tidal observations will be also borne in mind, so that with the co-operation of Colonel Walker's Trigonometrical Survey Department, we may eventually have an accurate tide-table of the principal ports in India. Tidal streams and currents and all such particulars will also be noted, and this information will subsequently be issued as sailing directions for the Indian coasts. Her Majesty's vessels, and private vessels employed in Indian waters, will also be invited to forward to the office any remarks on discoveries of dangers and errors in charts of Eastern Seas. The officers in charge of the Surveys will report on the lighting and buoying of the coast, inspect the light-houses, see to their proper maintenance, and make suggestions for alterations or for new lights. All changes in beacons and buoys, and notices of new lights, will be at once communicated to the Admiralty Hydrographer. The local authorities will furnish the Marine Survey Department with all information respecting their local navigation, and this information will, after careful comparison with the charts, be printed, issued as a notice to mariners, and widely circulated. A correct list of the light-houses and light-vessels on the coast of India will be published annually, and this in addition to charts and sailing directions, it will be the duty of the Department to supply to the nautical public.

The want of a responsible officer and staff to take charge of all these various important duties has long been felt, and there is little doubt that the usefulness of the new Marine Survey Department will soon be widely and fully recognized by the official and commercial world.

Hadhramaut.—From a pamphlet recently published at Constantinople (Tarikh i Hadhramaut, by Reshid), and apparently the Report of some Turkish emissary, we learn that Hadhramaut just now is split up into four distinct sovereignties at enmity with each other. The port of *Makalla* is held by a descendant of the family Küsadi, whose income is derived from custom's duties. The towns of Kutni and Shibam in the interior as well as the Harbour of Shihr own allegiance to the four sons of Omar, of the Kayuti family and members of the sect of Ismaelites. One of these, Salih, is at present in Haidarabad in India. The Temimi Bedouins exercise authority over the small states in the interior, and a sovereign of the Kütheiri family holds the remainder of the country, but is cut off from the

sea. The author of the pamphlet considers the latter to be the legitimate sovereign of all Hadhramaut, and tells us that in former times he acknowledged himself vassal of the Porte.

Coal on the Black Sea.—Anthracite having a specified weight of 1·64 has been discovered at Tuapse, a small Russian port, on the north-eastern shore of the Black Sea. This discovery is of the greatest importance to the steamers navigating the Black Sea. The Russian as well as the English company made use hitherto of the anthracite of Donetz, which cost about 18 kopeks a pud (30*s.* a ton) at Odessa. In future they will be able to procure the superior coal of Tuapse at a more reasonable rate. The Russian Government has resolved to construct a harbour at Tuapse, which will be connected by a branch line with the railway connecting Rostof on the Lower Don and Odessa. This railway will cross the Caucasus through a pass only 2300 feet above the sea level. (*Ausland*).

The Russian Expedition to Hissar.—The object of the Hissar Expedition, which left Tashkend in the middle of April last, is to explore the province of Hissar as far as the Oxus. Hissar is separated from the Russian Zarafshan district only by the valley of Shahr-i-Sebz, and yet it remains entirely unknown. It has been pointed out by M. Sobolef, in a paper published in the *Proceedings* of the Imperial Russian Geographical Society, that there is as great a difference of opinion as to the name of the chief town of Hissar as there is concerning the districts of Kulab, Shugnan, Darwaz, and Wakhai or Wakhan. Colonel Yule considers that Dehi Nau is the chief town of Hissar. M. Sobolef, however, thinks that Dushambe is the most important place. It is with the object of unravelling the knotty geographical points relating to that portion of Central Asia that the Russian Expedition, headed by M. Mayef, the editor of the *Russian Turkistan Gazette*, and accompanied by M. Weinberg, the Russian diplomatic agent in Asia, goes to Hissar. Besides these two gentlemen are M. Schwarz, astronomer, Lieutenants Kriftsof and Vishnefski (who, with M. Weinberg preceded the expedition, going on ahead through Samarkand, Shahr-i-Sebz and Karshi), M. Bakchurin, interpreter, and M. Matusof. The route will lie from Samarkand by a mountain track over the Takhta-Karacha Pass into the Shahr-i-Sebz Valley, and to Karshi, where the members of the expedition were to meet the Amîr of Bokhara. Passing from Shahr to Kitab (these are two-walled towns *within one enclosure* in the Shahr-i-Sebz Valley) the expedition will proceed by Yakobak (another fortified town in Shahr-i-Sebz) over the Kalta-Minar Pass and through the Charchak defile into Hissar, reaching Baisun, a town in the latter province. At Baisun and Karshi the expedition is instructed to collect all the information they can obtain relative to the roads leading from Karshi to Baisun through Guzar, as the road is very vaguely and incorrectly traced on all maps. From Baisun the expedition will visit all the chief towns under the Southern slopes of the Hissar Mountains, and from the city of Hissar it will pass to the point where the Surkhab joins the Oxus. From thence it will endeavour to penetrate to the Kulab, returning to Samarkand through the mountainous country at the sources of the Zarafshan, passing over the Anzob or some other pass into the valley of the Yagna-ab. The proposed route may be traced on Fedchenko's map published in *Ocean Highways* for August, 1873.

Since writing the above, a telegram has been published stating that the expedition had reached Karshi on the 29th of April, and was received in the most friendly manner by the Amîr of Bokhara. The members were about to proceed to Baisun, whence they would visit Kulab and Baljuan.

The Fair of Krasnovodsk.—This fair, which is held annually on the eastern shore of the Caspian, cannot take place this year, for the caravans travelling thither from Khiva and Bokhara have been attacked and plundered by the Teke Turkman.—*St. Petersbury Letter of 18th June.*

Kashmir and Kashgar.—A new work entitled *Kashmir and Kashgar: a Narrative of the Journey of the Embassy to Kashgar in* 1873-74, is now passing through the press, and will shortly be published by Messrs. Trübner and Co. This work, which is from the able pen of Dr. H. W. Bellew, C.S.I., Surgeon-Major, Bengal Staff Corps, who was attached to Sir Douglas Forsyth's party on his recent mission to Kashgar, will doubtless prove of great value to all those interested in Central Asia. We believe the work will be illustrated with a map and photographs of the different peoples met with.

A Railway to Timbuktu.—M. Paul Soleillet started on an expedition from Algiers in December, 1872, his intention being to reach St. Louis, on the Senegal, *viâ* Timkutu, but owing to the opposition of an insurgent chief, he was unable to proceed further than Insalah, an oasis nearly a thousand miles to the south of Algiers, and fully described by G. Rohlfs. In a lecture given at the Salle de Conferences M. Soleillet proposes seriously to construct a railway from Algiers to Timbuktu. He believes that the valuable merchandise from America, destined for southern and eastern Europe, would be forwarded by that route, and thus restore to the Mediterranean the importance necessary to the influence of the Latin races. M. Soleillet is a good patriot, no doubt, but his scheme, though apparently more feasible than the proposition of Mr. Skertchly, to convert the whole of the western Sahara into an inland sea, is not likely to be supported by capitalists.

Exploration of America.—The United States parties for geographical explorations and surveys west of the 100th meridian, under the Engineer Bureau of the War Department, and in immediate charge of Lieutenant George M. Wheeler, United States Engineers, were again to take the field about the end of May, the main points of departure being Puebla, Colorado, and Los Angeles, California. The California division will be under the immediate command of Lieutenant Wheeler, and will be composed of three main parties. The field of operations will embrace portions of Southern and Eastern California, including portions of the coast range and the Southern Sierra Nevada, extending eastward as far as Death Valley, continuing and connecting with the work of former years. The Colorado Division will be under the general control of Lieutenant W. L. Marshall, and will be subdivided into three working parties. The field of operations will be in Central New Mexico and Southern and South-Western Colorado. In addition

to the specific work of the Expedition, special examinations and surveys will be made with a view to determining as to the practicability of diverting the water of the Colorado of the West for irrigation and other purposes. A small party will also act in connection with a similar one sent out under the auspices of the Smithsonian Institution for making archæological investigations and collections in the Santa Catalina Islands, where it is believed ruins and relics of great interest exist. Although the appropriation made for the work is comparatively small, because of the simplicity of organization and improvements in methods and instruments, it is believed that the operations and valuable results will equal those of former years.

The Paraguay Commission.—Readers of the *Geographical Magazine* may remember that in the end of the year 1873 a commission was appointed by the representative of the Paraguayan Government in London, to examine and report on the resources of Paraguay. This commission consisted of Mr. Twite, geologist; M. Balansa, botanist; and Mr. Keith Johnston, geographer, and reached Asuncion early in 1874. Such, however, was the disturbed and bankrupt state of the country, after several revolutions, that the Government failed to carry out the stipulations of the contracts which had been made. After three months stay, Mr. Twite left the country. Mr. Johnston remained for more than a year, taking advantage of every opportunity that presented itself to travel in the interior during that time. M. Balansa is still, it is believed, in Paraguay, but in a completely destitute condition.

Samoa (Navigator) Islands. — The United States' war-vessel 'Tuscarora,' having on board a diplomatic agent, Colonel Steinberger, arrived at the Samoan Islands on the 27th of March last. The claims made by Americans against the Samoans are now being investigated, and the decision of the court of inquiry will be final. Colonel Steinberger's mission may probably lead to the protection of the United States being extended to the Samoan Islands, which have an area of 1087 square miles, and about 33,000 inhabitants. An account of this island group is to be found in the *Journal des Museum Godeffroy* for 1873, and in Brenchley's *Jottings during the Cruise of H.M.S. 'Curaçoa.'*

W. & A. K. Johnston v. the "Athenæum." —On June 16th the question was discussed of granting a new trial in this case. The Lord Justice Clerk said he thought there was no justification for the high damages given by the jury, amounting to 1275*l.* Lord Neaves thought the amount of damages utterly unjustified by the evidence. In his opinion the sum was outrageous. Mr. Fraser, for the pursuers, said he was in the hands of the court as to the amount of damages which ought to have been awarded in the former trial. The court, therefore, assessed the damages at 100*l.*

Australian Explorations. — Mr. Lewis's expedition to Lake Hope has proved successful. He examined the country between latitudes 25° 35′ and 28° 35′ S., and longitudes 135° 50′ and 139° 30′ E., and has been able to fill up a vacant place upon our maps, extending from the overland telegraph line to Sturt's stony desert, and from Lake Hope to Eyre Creek in Queensland. Before returning Mr. Lewis purposes to search for a route with a view of establishing direct overland communication between South Australia and Queensland. Lake Hope was perfectly dry. Mr. Ernest Giles, who had been exploring the country to the north of Fowler Bay, South Australia, telegraphs:—"Strangway's Springs, April 17, 1875.—Reached civilization again. Had one long stretch of 220 miles without water. All horses died; camels brought us. Love to all. Ernest Giles. Finnis Springs." Strangeway's Springs are a telegraph station to the south-west of Lake Eyre; Finnis Springs are to the south of it, likewise on the telegraph line.

Obituary.—We regret to have to announce the death of Mr. Thomas Baines, the great traveller. The deceased accompanied Gregory durning his famous north Australian Expedition (1855-6), joined the two Livingstone's on the Zambesi (1858-61), accompanied Mr. Chapman on a journey from the Walvisch Bay to Lake Ngami and the Victoria Falls (1858-68), and visited the Tati Gold Fields on behalf of a mining company established in London (1869). Several papers by him have been published in the *Journal of the Royal Geographical Society*, and jointly with Mr. Lord he is the author of a valued work on "Shifts and Expedients of Camp Life." Numerous sketches by him—he was an artist by profession—are to be seen at the rooms of the Royal Geographical Society.

Correspondence.

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BALASAGHUN, THE CAPITAL OF KARA KHITAI.

To the Editor of the "GEOGRAPHICAL MAGAZINE."

SIR,—In all the recent English maps of Central Asia known to me there is an important error to which I have not seen attention drawn. They all make the river Chu rise in the Issikul Lake. Now, Semenof, who went over this ground with considerable care so long ago as 1857, pointed out that the Chu does not *at present* rise in that lake, but that like the other great lakes, or rather seas, of Central Asia; the Caspian, the Aral, and the Balkash, the Issikul has no outlet. The result of his researches is shown very clearly in the exquisite map of this part of Asia, published in Petermann's *Mittheilungen*, in 1858. The facts shown in that map made the error an excusable one before the district was surveyed, but how it should remain still, even on such excellent maps as that appended to Sir Henry Rawlinson's recent and valuable work, I don't know. The real head waters of the Chu consist of three small streams, named the Shamsi, the Jumgan, and the Karakad, which rise in the Thian-Shan Range, and joining form the Kashkar. This flows in a north-easterly direction towards the Issikul, but according to Semenof (who followed its course), when it gets within 5 versts of that sea, it makes a sudden bend round a projecting ridge, and flows north-westward as the Chu, while a small brook actually flows into and not out of the Issikul from the west.

I said that the Chu does not *at present* flow out of Lake Issikul advisedly. It seems impossible to doubt, if we examine the topography of the district, that the Chu is not the same river that it was once. We cannot doubt that once it did not lose itself in the steppe lakes of Alzikul, but that it formed, with the Sari-su, a

common river, whose old bed is marked by the broken lakes of Telekul, Kultuk, and Yarmankul, until it eventually fell into the greatly enlarged Aral Lake. At that time we can well believe that the Chu was not the comparatively meagre and shallow river it is shown to be in the itineraries of routes in the Trans-Ili and Chu regions appended to Mr. Michell's work on the Russians in Central Asia, p. 503, &c., while the wastes of Kara Kum would then no doubt present a very different picture. In order that this should be so, the Chu must have received larger supplies of water, and we cannot doubt that the low flat tract that intervenes between it and the Issikul Lake is of recent formation, and that the two ranges of Kangi Alatau and Kirgizin Alatau, which now bound the lake, once formed the watersheds of the river. Semenof was impressed with this fact, and enlarges upon it (Petermann, op. cit., 360). He goes on to tell us that at the east end of the lake, near the *embouchure* of the river Tub, the Buruts point out the ruins of a town now underneath the water half a verst from the shore, and which can only be seen when the water is low, and there is still a legend current among the people there, about a city that once stood at the east end of the lake, but was overwhelmed by the sea. Semenof again tells us that the level of the sea is below that of the river Kashkar. Now, to account for these various facts, I cannot suggest a cause other than that operating elsewhere, and very little studied, namely, that the sea bed has sunk, and in sinking has created a natural dam for the head waters of the former Chu, and that these head-waters, instead of feeding it, now go to form the mighty inland sea of Issikul, and thus constitute it probably the largest lake in the world formed by the mere damming up of water. Whatever the explanation, the inferences suffices for me that the Chu was formerly, and at no very distant date, a much more important river than it is now.

Either upon or in close companionship with the Chu are several important old sites. Thus, Tokmak, which in the pages of the Mongol historian, Ssanang Setzen, gave its name to the khanate of the Golden Horde and Pishpek. Besides, there are some extensive ruins of former cities, as Merke Kurgan or Sary Kodsha, and Sari Kurgan. I propose to identify these last ruins with the site of Balasaghun, the capital of the Gurkhans of Kara Khitai, whose position has been a great deal discussed, but hitherto, I believe, fruitlessly.

The ruins of Sari Kurgan are otherwise known as It-Kichu or It Kiyu (see the maps appended to Sir Henry Rawlinson's *England and Russia in the East*, and to Michell's *Russians in Central Asia*, and the itineraries at the end of the latter work).

I will first draw attention to two almost contemporary itineraries of two travellers who crossed this district in the early part of the 13th century, in opposite directions, and which have been examined with his usual skill and clearness by Colonel Yule. I mean those of Rubruquis, and of the Chinese author who accompanied Khulagus in his march when he invaded the west (*Cathay and the Way Thither*, ccxi., &c.).

"Leaving the Volga on the 16th of September 1253, Rubruquis marched due east through the country of the Kankalis until the 31st of October, when, bearing a good deal south, he passed through certain Alps."

If he went directly east, as he says, his way would lead towards the present Orenburgskoe fort, and if he then turned towards the south, he would cross the Ulu-tau range. Colonel Yule thinks he went more south-east than east, and that the range he crossed was the Kara-tau, but I doubt whether the Karakum Desert would be chosen as the great eastern trade route of that day which was probably the one followed.

"On the 7th of November the travellers entered a plain irrigated like a garden, through which flowed a large river, which entered no sea, but after forming swamps was absorbed by the earth. It flowed from very high mountains they saw towards the south."

If the travellers took the northern route I suggest, the description would then answer very well to the Sari-Su which rises mainly in the Ak-tau mountains, and flows into a swamp.

"On the 8th they entered the city of Kenchac, they went from this east towards the mountains, and a few days later got among the mountain pastures where the Kara Khitai formerly dwelt."

Now, I believe Kenchac to have been situated not far from the Sari-Su, and that the mountain pastures referred to are the lower spurs of the Ak-tau and the Aktarli Mountains, which I believe were essentially the pastures of the Kara Khitai. Colonel Yule places Kenchack in the valley of the Talas, and identifies the Alps referred to with the range separating the Talas and the Chu.

After leaving the mountain pastures of the Kara Khitai Rubruquis and his companions found "a great river which they crossed in a boat; they then turned into a valley, where there were old entrenchments of earth, over which the plough had passed, and came to a good town called Equius where the Muhammadan inhabitants spoke Persian."

Colonel Yule and myself are quite agreed that this river is no other than the Chu, only I would make Rubruquis approach it from the north, and Colonel Yule from the south. The city of Equius, Colonel Yule says, "has been the subject of great difference of opinion;" and he says, "we must locate it north of the Chu somewhere opposite the modern Russian posts of Pishpek and Togmak."

I made a suggestion some time ago that Equius is word for word the It-kiyu of the maps, and in a letter from Colonel Yule, than whom no authority could be more supreme in such matters, he tells me that he is disposed to think that I am right. The situation on the Chu near its upper end, the similarity of name, and the existence of extensive ruins, combine to make the matter very nearly certain. Colonel Yule tells me his only objection is that these ruins are on the wrong side of the river to answer Rubruquis' description, but if, as I contend, Rubruquis took the northern route, and not the southern, the situation of these ruins on the left bank of the Chu, as marked in the better maps, is just in the right place. I have, therefore, no hesitation in identifying the Equius of Rubruquis with the It-kiyu of the maps. From this point onwards the narrative of the travels of the Friar has been made quite clear, thanks to the notes of Colonel Yule.

Let us now turn to the itinerary of the Chinese traveller. It has been translated both by Remusat in his *Nouveaux Melanges Asiatiques*, i., 171, and by Pauthier in his *Marco Polo*. This traveller tells us that four days before he reached the town of Talas, *i.e.* Taras, they passed through Itu a land between two mountains with a peaceable population engaged in trade. Canals meandered about, and were pleasant to the eye. There were many ruins, old walls and ramparts and places there. It was anciently the home of the Kitans. This country of Itu of the Chinese traveller is clearly the country of Equius of Rubruquis who describes it almost in the same terms, and its name is no other again, as I believe, than a corruption of It-kiyu of our maps. Let us now go back a few centuries, and consider the journey of the Buddhist Pilgrim Hiouen Thsang who traversed this region in the earlier half of the seventh century, and more especially the analytical memoir upon his narrative by M. Vivien de St. Martin. M. de St. Martin has shown that the Chinese *li* used as a measure of distance by the pilgrim is not the normal *li* but that 108 of his *lis* answer to 8 French leagues, and that his *li* is equal to 329 metres.

The original journal of Hiouen Thsang says that after travelling 500 *lis* to the north-west of the lake Thsing-tchi (*i.e.* lake Issikul, *vide* St. Martin *op. cit.* 17) he arrived at the town Su-yé-chui. St. Martin adds that the word Chui joined to the name of the town (which is

elsewhere called Suy-ché and Suy-hé) shows that it was situated on the river of that name, *i.e.* the Chu, and it answers exactly, as I believe, to the It-kiyu already mentioned. The town of Su-ché no longer exists, and neither its name nor its site are mentioned in the very detailed description of the country of Ili, and that west of Lake Issikul contain the Chinese Imperial geography (St. Martin *op. cit.* 21). This answers exactly to the fact that It-kiyu is a mere mass of ruins otherwise known as Sari Kurgan, *i.e.* the yellow mounds. I have no hesitation in identifying them as the same place. It will be remembered that Rubruquis speaks of Equius as a good town. Hiouen Thsang similarly speaks of Su-ye as a town 6 or 7 *lis* in circuit, and the rendezvous of merchants from different countries. West of Su-ye he says there were many isolated towns in each of which were chiefs independent of one another, but all subject to the Turks. After travelling 400 *lis* to the west of the river Su-ye he arrived at the thousand sources (in Chinese Thsien-Thsiuen or Ping-yu, in Mongul, Ming-bulak, in Turk Bin-gheul). The country of the thousand sources was about 200 *lis* square. On the south it was bounded by snowy mountains, and on the three other sides by continuous plains. The land was well watered, and the forests were very flourishing. After journeying for 140 to 150 *lis* to the west of the thousand sources, he arrived at the town of Ta-lo-se. That is after leaving the Chu at It-kiyu he travelled westward to the many sources of the river Karagatai, which are bounded on the south, as he says, by high mountains, namely, the Alexandrofsky Range, and then some 30 miles further to the city of Taras, now called Auliata on the river Taras. The details exactly fit in.

The original journal of Hiouen Thsang was supplemented by matter collected by his editors, Hoeili and Yenthsong, from other sources, and these very valuable additions are also translated by M. Stanislas Julien in his edition of the work. From them we learn that at Su-ye or in its neighbourhood, the travellers met with the Khan of the Turks who was then hunting, about him and the manners and customs of his people he gives some curious details. The Khan sent Hiouen Thsang on to his court (neither the name nor situation are given implicitly, but by implication Su-ye is clearly meant) where he joined him some days after. After leaving the Khan our traveller proceeded 400 *lis* to the west to the thousand sources, and then on to Taras (Vivien de St. Martin *op. cit.* 19). This is all very curious: the Khan of the Turks referred to is a well known potentate, the descendant of the half-mythical Afrasiab, the descendant again of Dizabulus to whom the ambassadors from Byzantium were sent about sixty years before the travels of the Buddhist pilgrims. He was the ancestor also of that dynasty which flourished so much in the 10th century, and known as the Ilek khans who ruled from the borders of Persia to those of China, and it seems clear that Si-yu was his capital, at least his southern capital, and that it survived as a flourishing town down to the 13th century. Having settled these facts let us now turn to the founder of the empire of Kara Khitai. His name was Yeliu Taishi, and his origines are given in some detail in the extracts made from the Chinese histories by Visdelou (*D'Herbelot's Bibliotheque Orientale* iv., 28). When the empire of the Khitans was overthrown by the Kin Tartars, he, an offshoot of the Khitan royal family, escaped westwards with only some 200 followers; he passed through the country of the White Tartars, where he was well received and entertained (Visdelou, *loc. cit.*). He then went on westward or rather north-westward, and arrived at the city of Khatun. I shall continue the story from Juveni: he tells us that he arrived on the frontier of the Kirghises, who showed a bold front, upon which he moved on towards the country of Imil, where he founded a town of which the ruins still remained when Juveni wrote (? Tarbagatai on the Emil which flows into Lake Alakul). Several Turkish tribes ranged themselves under his banner, and he presently found himself at the head of 40,000 families. He then marched towards Balasagun, a town which the Mongols call Gu-Balik. The sovereign of the country was descended from Efrasiab. He was no longer powerful, nor could he control the tribes of Karluks and Kankalis of that part of the country who made attacks upon his territory. Under these circumstances he sent envoys to the great chief who was approaching his country, to invite him to his capital, and offering to surrender the reigns of government into his hands. The Khitan prince upon this repaired to Balasagun, deprived the descendant of Afrasiab of his title of khan, leaving him only that of Ilk Turkan. He placed governors in all the provinces from Cum Kidjik (*i.e.* Kaptchak, the western portion of which was called Kumestan) to Burserdjan (?) and from Taraz (*i.e.* Taras) to Tamidz." All this is very clear, and there is no dispute among writers on the subject. The descendant of Afrasiab was no doubt the khan of the Turks, who had in fact at this time become weak, the princes of Bishbalig of Almalig and Kayalik, formerly his dependents, now being his peers. The city occupied by the conqueror was the Turkish capital which we have shown to have been "the city on the Chu," which is probably the literal translation of the Mongol name as given above, Gu-balik. It is the valley of the Chu and its surrounding heights which is specifically called the country of the Kara Khitai, and in this valley the only important town known to me at that period and much later was the Equius of Rubruquis. This site, too, answers admirably to the position of Balasagun as required by the narratives of the campaigns of the chiefs of the Seljuk and Khuarezmian empires against Kara Khitai as given by Major Raverty in his admirable translation of the Tabakat i Nasiri published in the *Bibliotheca Indica*. I am convinced, therefore, that the capital of the empire of Kara Khitai generally known by the wholly indefinite name of Balasagun, which merely means "city," was situated where the ruins of Sari-Kurgan on the Chu are placed.

I must now acknowledge the courteous letter of Professor Vámbéry upon a subject in which he is *facile princeps*, while I am no authority at all. I am pleased that he approves of my *negative* criticism. In regard to the positive one, I thought I was justified in leaning upon such authorities as Neshri, himself a native Ottoman historian, and Von Hammer, but I am convinced that Dr. Vámbéry's grammatical objection, which by the way has also been urged by my friend Dr. Rieu, is overwhelming. I may add in curious confirmation of M. Vámbéry's assertion that the native form of the word is Turkmen and not Turkman, that the old Russian chronicler Nikon uses the form Torkmeni. Can the terminal man be compared with man in Mussulman as I believe Erdmann suggests?

I am still puzzled, however, by some difficulties. How could Neshri a native Turk make such a mistake as to create an impossible compound, one contrary to the rules of Turkish syntax, and claim it as the etymology of the word Turkman? How do we explain again that the name is peculiar to the border-land of the early Muhammedans, and first occurs just at the time when the Turks were beginning to be converted?

In conclusion, can M. Vámbéry help me to the etymology of the Turkish tribal name Karluk or give me any facts about the Karluks. Von Hammer, I believe, derives it from the town of Kayalic. There is also a well known, and of course an entirely different town called Karjalik, south of Kashgar. It seems to me that the Karluks were the dominant Turks of Kashgar, and that the Arslan Khans of Kashgar mentioned by the Chinese were represented in the time of Jingis Khan by Arslan, Khan of Kayalik, a dependent of the Gurkhan of Kara Khitai. My letter has become longer than I expected, but the subject teems so much with suggestion that garrulity is perhaps a little excusable.

Yours, &c.,

HENRY H. HOWORTH.

Proceedings of Geographical Societies.

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ROYAL GEOGRAPHICAL SOCIETY.

Meeting of May 24th, 1875.

THE PRESIDENT'S ADDRESS.

THE anniversary meeting was held under the presidency of Sir Henry Rawlinson, K.C.B., F.R.S., at 1 P.M., at Burlington House. There was a crowded meeting, amongst those present being Count von Beust, Sir Bartle Frere, Sir George Bowen, &c.

The report of the Council was read by Mr. CLEMENTS MARKHAM, which stated that during the past year 294 ordinary members and one honorary corresponding member had been elected, bringing the total number of members to 2969.

The medals and prizes were awarded this year as follows:—The Founder's Medal to Lieutenant Weyprecht of the Austrian Navy, for the enterprise and ability he has displayed in the command of two exhibitions to the sea between Spitzbergen and Novaya Zemlya; for his discovery of new lands in the same sea; and for the many valuable scientific observations made during his voyages. The Patron's Medal to M. Julius Payer, for the great service he has rendered to geography by his explorations and discoveries in the Arctic regions; first, as member of the North German Expedition of 1869-70, in East Greenland, and afterwards, as second in command to Lieutenant Weyprecht, in the two Austrian Expeditions to the Novaya Zemlya Sea of 1871 and 1872-4, during the latter of which he led the sledge party in exploring the coasts of the newly-discovered Franz-Josef Land. Gold watch to Mr. W. H. Johnson, the explorer of the Kuen Lun and Khotan.

Public School Medals were presented as follows:—Gold medal to Henry Alexander Miers (Eton College); bronze medal to Archibald Edward Garrod (Marlborough College). Political geography: Gold medal to Sidney H. B. Saunders (Dulwich College); bronze medal to Wm. C. Graham (Eton College).

Sir HENRY RAWLINSON said that before reading his annual address on the progress of geography he was glad to announce that that day his Royal Highness the Duke of Edinburgh had been nominated to fill the office of Honorary Vice-President, according to his own wish, his Royal Highness intimating that, if requested, he would be glad at any time to take the chair at any of the meetings. In the course of his address the President said that on the 45th anniversary of the Society he was happy to be able to congratulate the Fellows on its increasing prosperity; and if they might judge from the repeated references that were made to the Society on geographical subjects from all parts of the world, their reputation and influence had certainly not diminished. It must indeed be a gratifying reflection to the Fellows of this Society that it was mainly owing to the urgent and persistent arguments impressed by their successive presidents on her Majesty's Government, that the great national undertaking of a Polar Expedition had been at length accomplished. The council, as their representatives, felt proud in having contributed to launch an enterprise which would not only yield the most valuable scientific results, but would redound to the honour of England, and would raise still higher the professional character of British sailors. After referring to the deaths of several well-known travellers, Sir Henry Rawlinson addressed the meeting at length on the subject of the expedition, and briefly referred to the Swedish Expedition which was about to start for the Kara Sea under Professor Nordenskiold, equipped chiefly through the munificence of M. Oscar Dickson, of Stockholm.

In conclusion, the President said that in encouraging the early study of geography, in fostering merit by honorary reward, in assisting travellers, in supporting expeditions, we do not merely aim at the accumulation of dry details of geographical science, but there are always practical views of sound public benefit underlying our efforts. Exploration, indeed, is the pioneer of progress. Travels in unknown regions lead to the introduction of civilization, the spread of commerce, the friendly intercourse of man with man. Among recent important works tending to improve the condition of mankind, which owe their origin more or less directly to geographical enterprise, we may point to the establishment of telegraphic communication across the Continent of Australia; to the serious efforts now being made for the suppression of the West African slave trade, which are the direct results of Livingstone's travels in Equatorial Africa; to the extension of trade in Central Asia; the colonization of Southern Africa; the opening out of lines of railway communication generally throughout the world. Even in the Arctic expedition, which is about to leave our shores, the high objects of national honour and professional efficiency have been as much considered as the acquisition of technical geographical knowledge.

In the evening the Fellows and their friends dined together at Willis's Rooms.

Meeting of June 14th, 1875.

ARCTIC SLEDGE-TRAVELLING.

THE PRESIDENT, SIR HENRY RAWLINSON, took the chair at 8.30 P.M. The theatre of Burlington House was crowded in every part, and was hung with a large circumpolar chart by Captain J. E. Davis, R.N., of the Hydrographic Office of the Admiralty.

Sir HENRY RAWLINSON said, before proceeding to the usual business of the evening, I take this opportunity of informing the Fellows that an extra meeting will be held this day fortnight in order to make up for that which was deferred in consequence of the sudden death of Admiral Sherard Osborn. At this extra meeting His Highness the Sultan of Zanzibar, who is one of the Honorary Members of the Society, will be present. He was sure His Highness would receive a hearty welcome, for it was mainly owing to his encouragement and support that the Society had been able to send an Expedition from the East Coast to the interior of Africa. Referring to the paper which was about to be read by Sir Leopold M'Clintock "on Arctic Sledge-Travelling," Sir Henry said that the subject was one of peculiar interest at the present time, for Sir Leopold M'Clintock, who is well-known in connection with Arctic exploration, had brought the system of sledge-travelling to such a degree of perfection that it would prove invaluable in the new Arctic Expedition.

Sir LEOPOLD M'CLINTOCK, who was very heartily received, said that whereas all other geographical discoveries were performed either by land or by water, modern Arctic exploration into the higher regions of the frigid zone is prosecuted independently of either, and the ice, which arrests the progress of the ship, forms the highway for the sledge. In early Arctic voyaging, the ship alone was relied upon for penetrating into unknown seas. In the second and third voyages of Parry, and the second voyage of Sir John Ross, between 1821 and 1834, sledging was commenced, and a number of short journeys were made, mainly by the assistance of the Esquimaux, whose methods were closely observed and more or less imitated. But our seamen had not yet familiarised themselves with the idea, that it was quite possible for well-equipped Europeans not only to exist, but to travel in an Arctic climate, as well as the Esquimaux themselves; and it was not until the Franklin Searching Expeditions were sent out, between 1848-54, and thus a motive far stronger than that of geographical

discovery was supplied, that men seriously reflected upon the possibility of any extensive exploration on foot.

Sledge-travelling is limited to the spring months. It cannot be commenced until there is sufficient daylight; it cannot be continued after the summer thaw has denuded the land of snow, or rendered the sea-ice unsafe: therefore it can seldom be prosecuted with advantage before the month of April or later than June.

The late Admiral Sir James Ross, the distinguished Commander of the Antarctic Expedition, who had served with very great credit in all the six voyages of Parry and John Ross, from 1818 to 1834, formed the connecting link between them and the Searching Expeditions which commenced in 1848, and the first of which he commanded. He was acquainted with the flat sledges of the Hudson's Bay territory, which alone can be used in deep snow, gliding as they do over its surface; he was also acquainted with the Greenland dog-sledge, with its high narrow runners shod with ivory or bone, and which cut down through the usually thin layer of snow, and run upon the ice beneath; he was familiar with the various modifications of these typical forms, which had been used in the Arctic Expeditions of Parry and John Ross. He had, moreover, made several journeys with the natives of Boothia Felix, culminating in his discovery of the Magnetic Pole; and on one of these journeys he was absent from his ship for the *then* unprecedented period of twenty-nine days. It was under his directions that our sledges and tents were made in 1848; and these designs, with comparatively slight modifications, have continued in favour in all subsequent expeditions. Sir Leopold then gave a detailed description of the sledge and tent, and described the mode of travelling in a way which entirely dispelled the supposition that it is merely skating over glassy ice or walking over deep snow on snow-shoes.

Salt-water ice is not so smooth as to be slippery; to skate upon it is very possible, though very fatiguing. But hardly is the sea frozen over, when the snow falls, and remains upon it all the winter. When it first falls, the snow is soft, and perhaps a foot or fifteen inches deep; but it is blown about by every wind, until having become like the finest sand, and hardened under a severe temperature, it consolidates into a covering of a few inches in depth, and becomes so compact, that the sledge-runner does not sink more than an inch or so: its specific gravity is then about half that of water. This expanse of snow is rarely smooth: its surface is broken into ridges or furrows by every strong wind. These ridges are the "Sastrugi" of Admiral Wrangell; and although the inequalities are seldom more than a foot high, they add greatly to the labour of travelling, especially when obliged to cross them at right angles.

As the spring season advances, the old winter snow becomes softened, fresh snow falls, and sledging is made more laborious still, until at length thaw arrives, and it is almost impossible to get along at all; but in a few days the snow dissolves, and fair progress is made over the now flooded ice.

Having accompanied Sir James Ross on his sledge-journey in 1849, I was entrusted with the preparations for sledge-travelling in the second and third Searching Expeditions, under Austin and Belcher; and this method of exploration now became recognised as an important feature of these voyages. The utmost attention was devoted to the travelling equipments, and to the methods adopted by Wrangell and other distinguished Arctic travellers; and the spring parties of the second expedition set out in 1851 on the 15th of April, instead of the 15th of May, as in 1849; and the sledges, carrying forty days' provisions, were dragged with less labour than thirty days' rations had previously occasioned: moreover, the allowance was a much more liberal one. The result was a corresponding increase of work done: one party remaining absent for eighty days, and making a journey of 900 miles. But in 1853 and 1854 the sledge parties of the third searching expedition did still better service: one party accomplished about 1400 miles in 105 days. Another party, having several depôts along its line of route and favourable circumstances generally, travelled nearly 1350 miles in seventy days.

The first was purely an exploring journey. Melville Island, which is some 50 miles broad, and is of moderate elevation, had to be crossed and recrossed. At the outset, very heavy loads had to be dragged; and ignorance of the direction in which the unknown coast-line might trend, interfered with the deposit of provisions to serve for the return journey; nevertheless, the daily average march was 12 miles. The second was a despatch journey, and it shows how rapidly ground can be got over with a tolerably light sledge, under somewhat favourable circumstancs; and it is a feat which the sailor, who is not generally credited with good marching powers, may justly point to with pride: throughout this journey the daily march averaged the astonishing distance of 20 miles.

Sir Leopold then briefly referred to the provisions and clothing found to be most suitable for Arctic travelling, and gave the following graphic description of the starting and progress of sledge-travelling parties.

It was on the morning of the 4th of April that they started from the 'Resolute' and 'Intrepid,' commanded by the late Admiral Sir Henry Kellet and myself, at Melville Island. Out of the 88 individuals composing the crews of both vessels, 71 were away sledging at one time; each separate sledge party consisting of one officer and 6 or 7 men. Each sledge hoists a gay silken banner, emblazoned with some heraldic device, some pointed motto, perhaps the name given to the sledge, or perhaps some mysterious initials, known only to the leader of the small party—a little mystery, however, which only awaits the return home of the Expedition for its satisfactory solution. After mutual cheers, they part upon their lonely and toilsome mission. But, trying as is the work before them, it would be difficult to over-rate the enthusiasm displayed. They have just passed through many months of darkness and confinement on board, spent chiefly in preparation for this great spring effort; nor is the keenest emulation wanting to complete a most impressive and characteristic display. Strong sense of duty, and an equally strong determination to accomplish it—dauntless resolution and indomitable will; that useful compound of stubbornness and endurance which is so eminently British, and to which we Islanders owe so much—certainly our colonies and our commerce, possibly even our existence as a nation.

These lonely little parties, daring and enduring so much, resemble sparks from that great fire which, I venture to say, is not yet extinct in this nation—the ardent love of the most adventurous enterprise. Each officer leads his party, selecting the route, jotting down everything noteworthy in his diary, making a running survey as they advance, and checking his estimated distances by astronomical observations. He is also constantly on the look-out for game. When he can leave these ordinary duties, he takes part in the manual labour of dragging the sledge. Clothed and fed like his men, he is housed, or rather tented, exactly as they are, sharing in all things with them; thus he becomes something more than the leader, or even the head of the party: he is its very pulse. These relations fairly established, he receives, in return, the most implicit confidence and devotion of his people. If he reserves anything for his own private use, it is his spoon; there being, of course, no washing up of mess-traps after meals in frosty weather.

In the extensive sledging operations of the third and last Government Searching Expediton, our entire immunity from severe frost-bites was in strong contrast with the second Expedition, where there were some thirty cases of seriously frost-bitten feet; and this fact affords most satisfactory proof of the greater efficiency of the men's clothing.

Before taking leave of these spring parties, let us glance at them on the march, and notice the amount of

work accomplished by those we have already alluded to.

During the month of April the snow is hard, and favourable for travelling, but the winds are of course still very cold; and if at all fresh, frost-bites are almost constantly playing about the men's faces. Thirst is also a good deal complained of. May differs in being milder: the sun is now constantly up; snow-blindness is more frequent than frost-bites, and, to avoid it as much as possible, the travellers sleep by day, and march by night. Some fresh snow falls, and therefore, although the sledges are lighter, the labour of dragging is scarcely diminished. Between the old frost-bites, the keen winds, and strong sun, all faces are badly blistered; most noses are absolutely raw, and finger-tips quite callous from frequent, though slight, frost-bites. Early in June, a few eider ducks, gulls, and ptarmigan appear. As the month advances, the snow becomes very soft. Soon the thaw bursts forth; the land is rendered impassable by innumerable streamlets; the sea-ice is flooded, and the whole aspect of nature has suddenly changed. Matters now look serious. But frost-bites are things of the past; even snow-blindness is less troublesome, and the abundance of water is an unspeakable relief. Those who have soap are now tempted to use it! This, however, is the season for rheumatic pains, consequent upon the daily march through ice-cold water.

The travellers return with prodigious appetites; they weigh on an average 12lbs. less than when they set out; they are reduced in strength as well as in flesh, yet they can walk for hours without fatigue; their sight for distant objects is much more keen, and their powers of observation of external objects, such as traces of men or animals, &c., much sharpened by exercise: in fact, they have advanced a stage towards the condition of the North American Indian.

The nine sledge parties employed in the spring of 1853, from the 'Resolute' and 'Intrepid,' accomplished in the aggregate 7000 miles, and discovered and explored about 1800 miles of coast-line. This single spring season's travelling may be taken as a suitable basis for calculating what possible amount of work may be performed by the out-going Arctic Expedition, provided that all the circumstances prove to be somewhat similar.

In the spring operations alluded to, Captain Nares took a share, and played his part well, giving proofs of those high qualities which have since borne such good fruit, and which so amply justify his translation from one very interesting and important command, to another still more important, more difficult, perhaps the most difficult to which a commander could aspire.

In the Government Searching Expeditions we gained no experience of snow-houses, and but little of sledging with dogs, yet that little was sufficient to convince us of their value. For instance, during the spring of 1854 our only team of dogs was kept constantly at work, and, without counting occasional short trips, they accomplished, in sixty days' travelling, 1830 miles, affording an average rate of 30 miles, their sledge on the whole being rather lighty laden. On several occasions they performed the distance of 60 miles between the 'Assistance' and 'North Star,' in from twenty to twenty-four hours.

The Government having finally abandoned the search, Lady Franklin nobly determined to make one more effort, and in 1857 she sent out the little 'Fox,' under my command. As our entire crew numbered only twenty four souls, the employment of dogs now became a necessity; accordingly twenty-four were embarked. In the spring of 1859 we sent out from the 'Fox' three separate divisions of search, each consisting of six men and six or seven dogs; each division accomplished about 1000 miles of distance, and men and dogs worked harmoniously together for the lengthened period of nearly eighty days.

Dogs are most useful when despatch is required, or when the temperature is so low that it is undesirable to expose more men than is absolutely necessary. Two men, with a good team of a dozen dogs, can travel with astonishing speed; the men securing themselves each night against frost-bite in a small snow-hut or burrow, when they can find a sufficient depth of snow to do so; but this is by no means always the case on sea-ice at a distance from the land. In this manner I made a journey of twenty-five days with fifteen dogs, a driver, and an interpreter. We started on the 17th of February, and accomplished 420 miles; the temperature, which was sometimes as low as —48°, averaged —30° throughout. Snow-huts were built each night, although we were very slow and clumsy masons, requiring an hour and a half, instead of from one half to three-quarters of an hour, to house ourselves. My dog-driver, whose previous experience had taught him what luxuries this mode of travelling was capable of, used to sleep warmly enough, with one dog at his back and another at his feet! An Esquimaux dog is more remarkable for the thickness of his fur than for anything else. He has a broad head and chest, keen scent, and strong dislike to the water. Our largest and best dogs measured 23 inches high at the shoulders, and weighed about 70 lbs. when in fair condition. Two dogs require the same weight of food as one man, and they will draw a man's full load for about one-fourth a greater distance than the man would. If both man and dogs are but lightly laden, the dogs will almost double the distance which the man could do.

All the experience gained in that memorable series of voyages between 1818 and 1859 has been brought to bear upon the equipment of the Expedition of 1875, and it is further intended that dogs and snow-huts should be used to a considerable extent. As on former occasions, so now also, upon the persistency of their efforts in sledging will mainly depend the amount of their success. To sledging we are indebted for almost all our modern Arctic achievements. To it we confidently look, as a means of escape where neither ships nor boats would avail. And here I would ask permission to quote from a paper which I wrote some years ago.—"It is now a comparatively easy matter to start with six or eight men, and six or seven weeks' provisions, and to travel some 600 miles across snowy wastes and frozen seas from which no sustenance can be obtained. There is now no known position, however remote, that a well-equipped crew could not effect their escape from by their own unaided efforts."

I had the great satisfaction of learning from Lieutenant Payer, when he recently visited this country, that these words of mine afforded very great encouragement to him and his companions, when their ship became inextricably beset, and when she was finally abandoned in the 80th parallel of latitude.

To sledging we owe many a thousand miles of coast-line discovered and explored. And, finally, the recovery of the sad, but glorious record of the heroic deeds of Franklin's Expedition. And to sledging we shall owe the principal share of whatever work may be accomplished by the brave men who have now gone out. What their measure of success may be, none dare predict. The public mind, perhaps unaware of the formidable difficulties which surround it, points to the crowning glory of reaching the North Pole—that goal of so much ambition and endeavour. This consummation is possible, and may the high distinction be theirs! But it is only fair to state, that so little practical improvement could be effected in the equipment of travelling parties, that we cannot reasonably expect that the sledging exploits of 1853 and 1854 will be eclipsed by those of 1875.

However, what has been done will be done again, if the state of the ice is at all similar; but of this we are, of course, uncertain. This is a grave uncertainty. We know that an open sea has been found at no great distance off the Siberian coast; and that it rendered nugatory all Wrangell's attempts to sledge northwards.

Yet it is worthy of remark that Wrangell was one of the first, if not the very first person, to suggest an attempt to reach the Pole from Smith Sound.

No reliable indications of a similar state of things to that which he experienced off Siberia has been found anywhere northward of the islands and shores of America. We have occasionally been startled by announcements of open water; but a little further exploration has proved these iceless spaces, or polynias, to be very limited in extent, and solely due to local and apparent causes, such as currents or tides, and they have only been found in straits, and not to seaward of an open coast-line.

Captain Nares has this advantage over Wrangell, that he is provided with boats fit to navigate a partially iceless sea, should his sledging be interrupted by water. Now, we know that the failure of Parry's attempt to reach the North Pole in 1827, was largely due to the great weight of his boats, and the consequent difficulty of dragging them over the ice. This error we have attempted to correct, by supplying boats of considerably less than half the weight of Parry's. But Arctic explorers are well aware that there is one condition which bars all progress: and that is—ice which is too thin to sledge over. Let us hope that our explorers may not meet with any such insuperable difficulty. We know full well that ordinary obstructions will but strengthen their determination to solve the great geographical problem committed to them; and we have the satisfaction of knowing that this national undertaking could not be placed in abler hands. They will carry with them the assurance that they have not only our heartiest wishes for their success, but our entire confidence in their resolute endeavours to deserve it.

Admiral Sir RICHARD COLLINSON said, when the expedition in which he was engaged left England in 1850 they had the advantage of the experience gained up to 1849; but as they did not return until 1853 they could not profit by the improvements made in the intervening years, and were thrown upon their own resources. He started originally from Behring Straits with three dogs, harnessed next to the sledge, with the men in front of them. In the course of the winter they had an addition of three more, which, of course, were not of much use the first year, but in the second and third years were a great help. They became so attached to the ship, that when the ice broke up, and they could not get on board in any other way, they would go round for miles so as to get on the pack on the opposite side, and so reach the vessel. On one occasion, in travelling up the Victoria Strait, he was 13 days absent from the ship, and one night was aroused by the dogs giving tongue. He found the disturbance was caused by the presence of a bear, and the party set off in chase, but were unable to overtake him. When they returned to the sledge, they found that a favourite dog was missing. They waited some time, but at last had to go on without him. In the middle of the next night, however, the dog overtook them. In all probability he had chased the bear, and brought him to bay, and stuck by him, hoping that the party would come up; but eventually had to abandon the bear, and had the sagacity to follow the new track of the sledge instead of that which led back to the ship. When he returned nothing would satisfy him but to enter the tent and salute every one.

Dr. RAE said he had listened with great pleasure to the admirable paper that had been read, but differed from Sir Leopold as to the kind of sledge best adapted for Arctic work. He tried the runner-sledges in 1847, and made a journey of about 600 miles; but for one-half of the distance the sledges could not be used at all, being so rotten, and everything had to be carried. He had brought with him to the meeting a rough sketch of the sledge which he considered best adapted to the work, Flat-bottomed sledges were used in the large lakes, such as Superior, Winnipeg, and Bear Lake; but in the spring those lakes were covered with water, and therefore, when a sledge had a load of fine furs, the cargo must be so raised that the water could not reach it. Dr. Rae then described, with the aid of diagrams which he exhibited, the formation of his flat-bottomed sledge. It could not sink, he said, more than an inch or two, for the moment the snow got beyond the runners the whole of the flat body of the sledge rested on the snow. The runners were shod with steel and rounded off, so that the friction was extremely small. He was delighted to hear that the new Expedition would have recourse to snow-houses, which would enable them to reduce the weight on the sledges, there being no tents to carry, and less bedding.

Admiral OMMANNEY expressed his admiration at the able way in which Sir Leopold had treated his subject. He (Sir Leopold) had, however, omitted to mention one of the great feats which he performed in 1851, when he made a journey of 600 miles in eighty days, and settled the question as to whether or not Sir John Franklin had wintered in Melville Island. He himself (Admiral Ommanney) was at the same time away from the ship for sixty days, and they both returned without any reduction in their size and better in health than when they started. Even if Captain Nares only equalled what had been done before, he would explore a great deal of hitherto unknown land. No fear was to be apprehended about the safety of the Expedition; and even if the Pole were not reached, he should be satisfied if Captain Nares came round the north of Greenland and returned to England by the East Coast. No Expedition had ever left this country so perfectly equipped, and no finer sailors had ever visited the Arctic regions.

Admiral RICHARDS said he should very much regret if an impression was allowed to go abroad that the Expedition had not been provided with the right kind of sledges. Due credit must be given to the Hudson Bay gentlemen for the great work they had done, and no doubt they employed the means best adapted to their purposes; but the mode of travelling best suited to higher latitudes was quite different. A sledge party sometimes left the ships for three months at a time, and of course could not carry several different kinds of sledges, even if they wanted them. As to snow-houses, it was utterly impossible to trust to them, for out of a journey of 120 days probably there would be 40 days when no snow could be obtained with which to make huts. They could not very well build snow-houses when travelling knee-deep in water; they were, therefore, obliged to take with them all the materials required for the whole journey.

Sir LEOPOLD M'CLINTOCK, in reply, said Dr. Rae and himself had talked over the details to which Dr. Rae had alluded, twenty years ago, and they were thoroughly acquainted with each other's views. If Dr. Rae had really and sincerely felt that he could have aided the Arctic Expedition by his diagrams and plans, he undoubtedly would have exhibited them before the vessels started. The flat-sledge for raising the cargo a foot or 14 inches higher was a very good makeshift, but nothing more, for travelling where the snow was soft or covered with water; but it would be topheavy, and upset the moment it attempted to move over hummocks. No Government Expedition had ever left this country without being provided with flat sledges, and abundant opportunity had been afforded of testing them, but they had been invariably discarded. He had taken them with him, and had found that when the cargo was on them they rolled over when they came to hummocky ice. Every one could understand that for rough ice it was better to have steel runners, after the fashion of skates. If they trusted to Dr. Rae's flat sledges, and when 300 or 400 miles from the ships the provisions were upset and spoiled, it would be unpleasant, to say the least of it. He himself had travelled nearly 5000 miles with sledges, and nearly 50,000 miles of sledging had been accomplished by the different Arctic Expeditions; there had been great competition among the leaders, each striving to invent something new, and it had been

found that by grouping the men together better work was done than when small sledges, with only one or two men, were used. The longer the sledge the more easily it travelled, on the same principle that a large wheel would run more easily than a small one. Formerly sledges were only 10 feet long, but now they were made 14 feet; and for one description of work, namely, attempting to cross fissures and glaciers, they had 16-feet sledges. It would puzzle even Dr. Rae himself to carry a 20-feet boat to the Pole on a flat sledge; it was necessary to have large and wide sledges. The Arctic Expedition which had just started had sledges of different lengths: 16 feet; 14 feet (in which he hoped the Pole would be reached); 11 feet, to be drawn by seven men, and to do the great bulk of the work; 8 feet, for carrying dispatches, to be drawn by dogs; and 6 feet, or satellite sledges. His object in building these small ones was to enable the naturalists, with very little assistance, to drag their own specimens. He had tried snow-houses in the 'Fox' Expedition, and had made it a part of the exercise during the winter to build them. He found that parties of four men each could hut themselves in about thirty-five minutes, under favourable circumstances; but the farther north the Expedition went, and the further from the shore a party was, the less frequently was snow met with suited for building these houses. A tent to enclose eight men weighed only about 40 lbs., which was a mere trifle. It was Captain Nares' intention to make snow-huts wherever he considered it advisable, and he had been provided with snow-knives and saws, and everything necessary for the purpose. If a depôt were formed, say 100 miles from the ship, a series of snow-huts would be built between the two, so as to obviate the necessity, in such a case, of carrying tents.

In conclusion, the PRESIDENT said these discussions with regard to sledge-travelling were of very great interest, because it was upon sledge-travelling that the success of the new Expedition mainly depended. There was no very determinate scientific advantage to be gained by reaching the Pole, though there was a certain popular sentiment with regard to that object, and no doubt the nation would be very much disappointed if the Pole were not reached. It was evident that if the expeditions which Sir Leopold M'Clintock had described had been directed northwards, instead of east and west, the Pole would have been reached. From the point where Captain Nares hoped to winter in 82° N., it was only 480 geographical miles to the Pole; and at the rate at which Lieutenant Mecham travelled, the journey would only occupy from 25 to 30 days. The great object of the Expedition was to run as far north as possible, and to establish depôts along the route, so that the intervals over which sledge parties would have to carry their own provisions might be as small as possible. If such depôts could be formed halfway between 82° N. and the Pole, there could be no doubt that the remainder of the distance could readily be accomplished. At the same time this was not the essential scientific object in view. All would be very much delighted if the Pole were reached, but even if it were not, there could be but little doubt that many valuable scientific results would be attained, which would be intrinsically of much greater importance.

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FRENCH GEOGRAPHICAL SOCIETY.

December 22nd, 1874.—The fifty-fourth anniversary dinner took place in the "Grand Hotel," Rear-Admiral Baron de la Roncière-le-Noury, President of the Society, in the chair, supported by the Comte de Paris, MM. Paul Mirabaud, Delesse, V. A. Malte-Brun, E. Levasseur, Maunoir, C. Delemarre, Baron Reille, and others. Toasts were drunk in honour of the President of the Republic, of the President of the Society, of the foreign Geographical Societies, of the Geographical Congress, the fraternal union of all nations, of explorers, geographical science, commerce and industry, geographical erudition, the memory of Francis Garnier, &c.

January 20th, 1875.—M. Delesse in the chair. The President announced the death of M. d'Avezac, one of the oldest and most active members of the Society, six times its President, fourteen times one of its Vice-Presidents, and lately elected Honorary President for life. M. Brunet de Presle reported favourably on the financial position of the Society. M. Hugo said that concessions had been granted for building railways from Lorenço Marquez (Delagoa Bay) to Pretoria, and from Loando to Asubaca on the Quanza River. Baron d'Avril read letters received from Colonel Gordon, now on the Upper Nile. The Abbé Petitot read a paper on his explorations in the Mackenzie Basin. He considered that the decrease of the native population was due principally to uncleanliness and to a disregard of sanitary laws.

February 3rd, 1875.—M. Delesse in the chair. Three letters from M. Henry Duveyrier were read, giving an account of the progress of Captain Roudaire's expedition to the Shotts. The Secretary said that this expedition, consisting of M. Roudaire, Parizot, Martin, Duveyrier, and Dr. Jaquement had left Biskra on the 2nd December, 1874, for the purpose of fully exploring the Shotts of Southern Algeria, with a view to their being converted into an inland sea. The French Government had granted 400*l.* towards its expenses, and the Geographical Society 60*l.*, but further funds would be required if it was to be brought to a successful issue. M. Paul Soleillet then explained his scheme for exploring the Western Sahara. He proposes to travel to Timbuktu by way of Insalah.

February 17th, 1875.—M. Delesse in the chair. The President said that 120*l.* had been granted for completing the spirit levelling to the Shotts of Algeria, and 80*l.* to Dr. Harmand, who was about to visit Further India. Mr. Arthur Russell, on behalf of the Royal Geographical Society of London, expressed the sympathy of that body on the death of M. d'Avezac. A profile of the newly-constructed road between Trebizond and Erzerum, by M. Gilbert, was exhibited to the meeting, and will be published in the *Bulletin*. Two letters from M. Henri Duveyrier were read; they are written from the camp of Muya-el-Tunzi, and refer to the region of the Shotts and the progress made in its exploration. The heights between the Shotts Melghigh and el Rharsa, in the opinion of M. Le Chatelier, the engineer attached to the expedition, would offer considerable obstacles to the creation of a Saharan Sea. M. de Lesseps described the submarine tunnel, by means of which it is proposed to join France and England.

March 3rd, 1875.—M. Delesse in the chair. The President announced that the King of the Belgians had subscribed 40*l.* towards the expenses of the Geographical Congress. M. Hertz said that M. Largneau had succeeded in reaching Ghadames from Tuggurt, by the route previously followed by M. Dournaux-Dupéré. The Marquis de Compiégne explained his project of a second voyage into Equatorial Africa, and M. Pinart that of an exploration of Alaska.

M. Malte-Brun announced that the Prize Commission of the Society has awarded Gold Medals to the Abbé David, for his travels in Mongolia, and to Dr. Schweinfurth of Riga; and silver medals to the Abbé Petitot, for the information collected by him whilst on the Mackenzie River, and to Messrs. Marche and Compiègne, for their exploration of the Ogowe. The prize founded by the late M. La Roquette for discoveries in the Arctic Regions, had not yet been awarded.

March 17th, 1875.—M. Delesse in the chair. The President announced that the Society had headed a list of subscriptions in support of M. Compiègne's expedition with 40*l.* M. José da Silva Mendes-Léal presented a photograph of Manoel Godinho de Heredias' letter, in which the discovery of Australia is claimed for the Portuguese. M. Maunoir availed himself of this opportunity to draw attention to the erudite researches of Mr. Major, of the British Museum, according to whom

Australia had been discovered by the French long before 1601. Captain Roudaire, head of the expedition for exploring the Shotts (of which M. H. Duveyrier, Le Chatelier, and others are members), reports on the favourable progress of their labours. A letter from M. Largeau was read, in which that traveller describes the country between Tuggurt and Ghadames. M. Largeau proposes to return to Ghadames with a caravan, and informs the Society that the murderers of M. Douneaux-Dupéré have been executed by order of el Haj Ikhenhukhen. M. A. Germain read a paper on "the first Meridian and the French Nautical Almanack (Connaissance des Temps)," in which he defended that work against the attacks made upon it by M. Struve. MM. Perier and de Chancourtois took part in the discussion, the latter proposing to return to the Meridian of Ptolemy and Mercator, which passed through the island of St. Michael. Dr. Cosson reports on the acclimatation of eucalyptus in Algeria, which has rendered the banks of the Fezzara and other localities perfectly salubrious. The eucalyptus was being rapidly propagated by the colonists, and furnished excellent timber. Captain Ney said he had been stationed during three years at the village Ainmokra, on the Fezzara Lake, which was the centre of the iron mines of the Mokta el Hadid, worked by convicts. Formerly this district was exceedingly insalubrious, but since the introduction of the eucalyptus, in 1873, fever had almost entirely disappeared. Dr. Cosson said that the eucalyptus might be cultivated in any part of the world where the temperature did not fall below freezing point, but that plants of some age were able to resist a cold of 4°C. Localities suited to it might be found in the West of France. M. Bionne said that his experiments in the South of France had failed hitherto.

M. Deyrolles exhibited a photographic apparatus for the use of travellers.

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IMPERIAL RUSSIAN GEOGRAPHICAL SOCIETY.

AT the meeting of the 7th (19th) of May, M. P. de Semenof, Vice-President, being in the chair, M. Wilson, the Secretary, read his monthly report, in the course of which he paid tribute to the memory of M. Kovalevsky, who had recently died at Tiflis, and who since 1861 had been the most active member of the Caucasian section of the Society. After enumerating some valuable presents of books and maps which had been made during the past month, the Secretary announced that the levelling expedition in Siberia was equipped and would start in a few days. M. Chekanofsy had set out for the Lower Lena, and the tundras of the Olenek, with the view of completing his previous explorations. The meteorological observations taken at Nukus and Petro-Alexandrovsk on the occasion of the recent Oxus Expedition have been received by the Society, and an article on them has appeared in the second number of the *Bulletin*.

News has been received from M. Miklucho-Maklay, dated Singapore, the 6th of May. He furnishes an account of his travels in the early part of the year in the Malay Peninsula in quest of an aboriginal race of Papuan extraction. The journey lasted two months, and being commenced before the end of the rains proved exceedingly arduous, Maklay having to cross tracts of forest and plain up to his waist in water, and suffering greatly from the attacks of scorpions and other reptiles. The Semangs, as the wild mountaineers are called, are nomads of primitive habits, and appear to be fast disappearing before the encroaching civilization of the Malays and Chinese. In them M. Maklay clearly discerned the existence of a non-Malay type. He proposes shortly to return to Russia, and there to arrange the results of his investigations for publication.

The fifth volume of the *Geographical Memoirs* published by the Society appeared in April, and contains papers by Prince Kiapotkin on the mountain systems of Eastern Siberia, by M. Fritsche on the drainage of Mongolia, by Baron Kaulbars on the Thian-Shan, and by Captain Sosnofsky on his expedition through Northern China to Bulun Tokoi.

M. Veniukof read a letter from M. Mayef, giving details respecting his proposed journey to Bokhara, Shahri-Sebz, and Hissar. An account of this expedition will be found in the Log Book of our present number.

M. Kuznetsof then exhibited a statistical map showing the Lithuanian population of Russia, and designed so as to display the ethnographical features of Lithuania as well as the influence exercised on the language by Russia, Poland, and Germany respectively. The meeting concluded with the announcement of the election of new members.

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BERLIN GEOGRAPHICAL SOCIETY.

February 6th.—Baron Richthofen, President, in the chair. Dr. Bastian reported on the progress of the West African Expedition. The health of the members stationed at Chinchoxo left nothing to be desired, and only Dr. Güssfeldt had suffered from repeated attacks of fever, but always recovered on his return to the coast station. In September last Dr. Güssfledt ascended the Nyanga River to the narrows of Mongo Nyanga, in the Balombe country, and then ascended the plateau inhabited by the Bayaka. The furthest point reached by him was Intinde, whence blue mountains could be seen in the distance. Preparations for organising a caravan were in progress. The employment of elephants, which had been proposed by Dr. A. Petermann, could not be entertained, not only because of the expense, but likewise because it was uncertain whether the climate and vegetation of Western Africa would agree with them. The African elephant had certainly been employed by the Ptolemeans and Carthaginians in their wars, and although it was most desirable to utilize this animal, this could hardly be done for the present expedition. Dr. Richard Kiepert discussed, "The last journals of David Livingstone."

March 6th.—Baron Richthofen in the chair. The President announced the death of M. d'Avezac in Paris, and of Sir Charles Lyell in London, who had been honorary members of the society, and had rendered eminent service to geographical science. Herr von Boguslavski read a paper on the deep sea soundings and temperature observations made on board the German war steamer 'Gazelle,' Captain von Schleinitz, and alluded incidentally to similar observations made on board the 'Challenger,' the 'Tuscarora' and others. The points touched by the 'Gazelle' are Madeira, the Cape Verd Islands, Monrovia, Ascension, the Congo and Cape Town. The deepest sounding (2825 fathoms) was effected in latitude 24° 24' S., 0° 12' W. of Greenwich. The greatest ascertained depth in the North Atlantic was 2765 fathoms, in latitude 23° 19' N. 23° 21' W., near the track of the 'Challenger' whose results agree remarkably well with those of the German vessel. The Cape Verd Islands rise on a submarine annular plateau. The existence of cold submarine currents, discovered by the 'Lightning' and 'Porcupine' expeditions, is confirmed by the temperature observations of the 'Gazelle.' The arctic and antarctic currents appear to mingle in about latitude 36° N. and longitude 17° to 18° W., and the surface temperature near the equator was found to be lower than either to the north or south of it. From Cape Town the 'Gazelle' proceeded to Kerguelen Land, and is now on her home voyage through Torres Strait and the Pacific.

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VIENNA GEOGRAPHICAL SOCIETY.—*January 26th*, 1875. Professor F. V. Hochstetter in the chair. The chairman announced that the Council had appointed

Mr. Julius Payer General Secretary of the Society, an office corresponding to that of the Assistant Secretary of the Royal Geographical Society. The President said that Lieutenant A. Lux, a member of the Society, had proceeded to the West Coast of Africa, in order to join Captain Homeyer's section of the German West African Expedition. This section now included Captain Homeyer of Görlitz, as zoologist, Dr. Soyeaux of Berlin, as botanist, Lieutenant Lux as surveyor, and Baron Pagge of Mecklenburg, as a volunteer. Mr. J. Payer then discussed various schemes of Arctic exploration, and strongly advocated an expedition into the interior of Greenland. Mr. G. Wex then read a paper on the constant decrease of the rivers and springs, and on the means of remedying this evil. We learn from the "Report for 1874," presented at this meeting, that the Society now numbers 605 ordinary members. The income (including a balance of 259*l.*) amounted to 803*l.*, the expenditure to 451*l.* The balance in hand, at the close of 1874, was 352*l.*, in addition to 1356*l.*, the amount of a legacy left to the Society by Heinrich Lamquet.

February 23rd, 1875.—F. von Hochstetter in the chair. Baron Hofmann read letters from the Austrian Consul Hansal, at Khartum, and from Mr. Marno, which report on the progress of Gordon's Nile expedition (see *Geographical Magazine* for April). Dr. Göehlert read a paper on the Bukowina, Dr. O. Gross on the proposed canal between Danube and Oder.

March 23rd.—Mr. A. Steinhauser in the chair. Mr. Julius Payer described the outfit of the English Arctic Expedition; Mr. Kanitz read a paper on the history, ethnography, and cartography of Bulgaria and the Balkan.

April 27th.—Dr. F. von Hochstetter in the chair. The President read two letters received from Mr. Marno. Mr. Rzitha then read a paper on the commercial importance of the Gotthard railway, and Dr. Gintl gave an account of the petroleum region of Galicia.

LEIPZIG GEOGRAPHICAL SOCIETY.—*February 10th*, Dr. R. Andree, V. P., in the chair. Dr. Ebers read a paper on the "Papyros Ebers" discovered by him in Egypt, and now preserved in the Leipzig University Library. This valuable medical treatise is about to be published. A. Goering exhibited water-colour drawings made by him in Venezuela.

Anniversary meeting, *March 17th*. Professor Bruhns, President, in the chair. The Society now numbers 315 ordinary members, and expended 139*l.* in the past year. G. Rohlfs read a paper on the Libyan Oases, and J. Löwenberg on "Lady Geographers and Travellers."

DRESDEN GEOGRAPHICAL SOCIETY.—No less than eight meetings were held in the course of January and February, Prof. Ruge, the president generally taking the chair. There are sections for educational geography and emigration. Amongst the papers read the following are of general interest:—Captain Kröber on a curvimeter; Dr. Meinicke on the Marquesas; H. Ackermann on the German Element in the United States; Dr. A. B. Meyer on travels in the Indian Archipelago and New Guinea; H. Friedemann, on the pronunciation of English geographical names.

MUNICH GEOGRAPHICAL SOCIETY.—*February 12th*. Prof. von Jolly, President, in the chair. Prof. J. Kollman gave an account of the Dohrn's zoological station and of an ascent of Vesuvius.

March 5th.—Dr. L. Graff discussed the results obtained by the "Challenger Expedition."

ANTHROPOLOGICAL INSTITUTE, *22nd June*.—Colonel Lane Fox in the chair. A paper was read "On the Papuans of New Guinea," written and communicated to the Institute by Captain Lawson, author of *Wanderings in New Guinea*. Before the paper was read it was urged upon the Chairman that the credibility of the author ought to be established before a learned Society before the Institution was allowed to become the vehicle of disseminating his writings. This question, however, was overruled by the chair, and the reading of the paper was proceeded with. There was nothing extravagant or remarkable in it, although some of its statements were found to be inconsistent with the authenticated reports of other observers, among which the structure of the native dwellings may be specified. In the discussion which followed the reading of the paper, Professor Rolleston, Mr. Trelawney Saunders, Mr. Charlesworth, and Dr. Bush took part, and all concurred in conclusions unfavourable to the credibility of the author. In the end the Chairman said that it would be premature to return the usual vote of thanks to the author of the paper.

PALESTINE EXPLORATION FUND.—*Annual Meeting June 10th.*—The Archbishop of Canterbury presided. Mr. George Grove, the honorary secretary, read the report, which stated that the season's field work was resumed last October in the hill country south of Judah. By the last accounts, very nearly the whole of this little-known south country, including Philistia, had been triangulated. Since the last anniversary 1500 square miles had been added to the map. Several important places had been identified, or their previous identification confirmed by Lieutenant Conder, including the hill of Hachilah, the rock of Maon, Zanoah, Aral, Maarath, Chozeba, Beth Zetho, the Levitical city of Debir, the cave of Adullam, the altar of Ed, &c. Two of the most valuable discoveries of the year were due to M. Clement Ganeau, viz., the boundary of Gezer, and the city of Adullam. The total area now surveyed is 4430 square miles, leaving 1500 to be still filled in, to which must be added the reconnaissance of the Negeb, or south country, to complete the survey of Western Palestine. A map of the whole country this side the Jordan will be brought to England in the autumn of 1876, and given to the world a year later, on a scale of one inch to the mile. The total income of the fund last year was 4179*l.* 18*s.* 11*d.* The cost of the expeditions in Palestine had been 3500*l.* and the heavy debt with which the year commenced had already been cleared off. Captain Richard Burton moved a resolution expressing satisfaction at the intelligence of the despatch of a new expedition from America for the exploration of Trans-Jordanic Palestine.

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